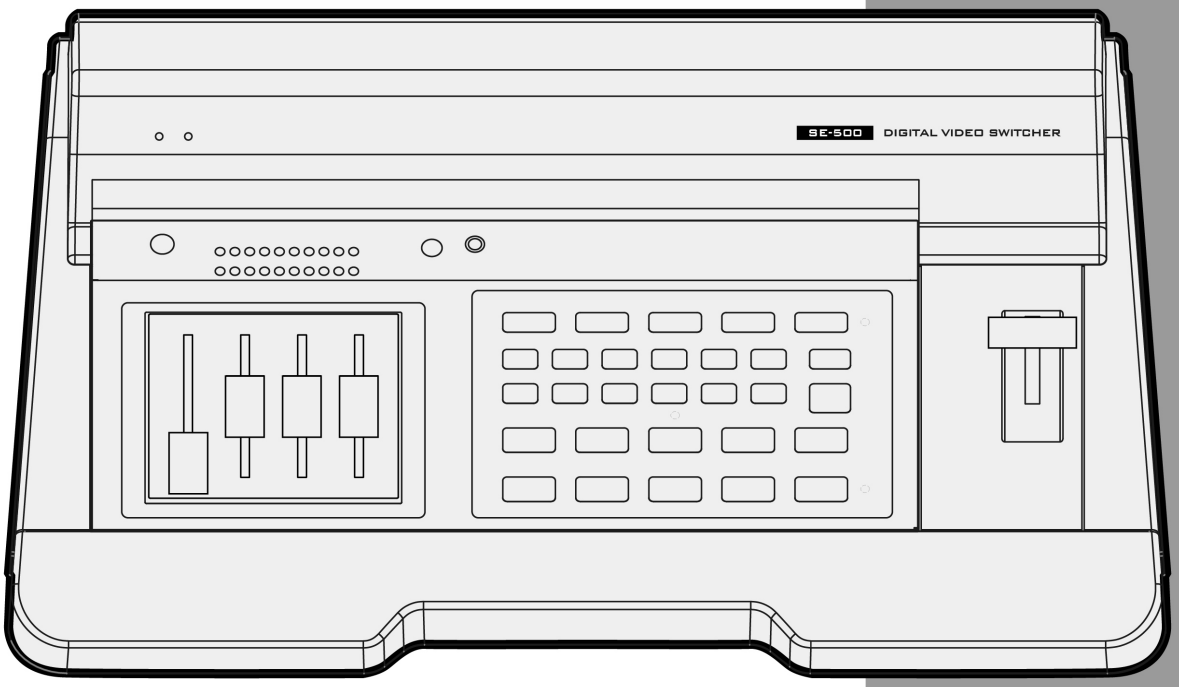
datavideo



DIGITAL VIDEO SWITCHER

SE-500

Instruction Manual

www.datavideo.com

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Warnings and Precautions

1. Read all of these warnings and save them for later reference.
2. Follow all warnings and instructions marked on this unit.
3. Unplug this unit from the wall outlet before cleaning. Do not use liquid or aerosol cleaners. Use a damp cloth for cleaning.
4. Do not use this unit in or near water.
5. Do not place this unit on an unstable cart, stand, or table. The unit may fall, causing serious damage.
6. Slots and openings on the cabinet top, back, and bottom are provided for ventilation. To ensure safe and reliable operation of this unit, and to protect it from overheating, do not block or cover these openings. Do not place this unit on a bed, sofa, rug, or similar surface, as the ventilation openings on the bottom of the cabinet will be blocked. This unit should never be placed near or over a heat register or radiator. This unit should not be placed in a built-in installation unless proper ventilation is provided.
7. This product should only be operated from the type of power source indicated on the marking label of the AC adapter. If you are not sure of the type of power available, consult your Datavideo dealer or your local power company.
8. Do not allow anything to rest on the power cord. Do not locate this unit where the power cord will be walked on, rolled over, or otherwise stressed.
9. If an extension cord must be used with this unit, make sure that the total of the ampere ratings on the products plugged into the extension cord do not exceed the extension cord's rating.
10. Make sure that the total amperes of all the units that are plugged into a single wall outlet do not exceed 15 amperes.
11. Never push objects of any kind into this unit through the cabinet ventilation slots, as they may touch dangerous voltage points or short out parts that could result in risk of fire or electric shock. Never spill liquid of any kind onto or into this unit.
12. Except as specifically explained elsewhere in this manual, do not attempt to service this product yourself. Opening or removing covers that are marked "Do Not Remove" may expose you to dangerous voltage points or other risks, and will void your warranty. Refer all service issues to qualified service personnel.
13. Unplug this product from the wall outlet and refer to qualified service personnel under the following conditions:
    a. When the power cord is damaged or frayed;
    b. When liquid has spilled into the unit;
    c. When the product has been exposed to rain or water;
    d. When the product does not operate normally under normal operating conditions. Adjust only those controls that are covered by the operating instructions in this manual; improper adjustment of other controls may result in damage to the unit and may often require extensive work by a qualified technician to restore the unit to normal operation;
    e. When the product has been dropped or the cabinet has been damaged;
    f. When the product exhibits a distinct change in performance, indicating a need for service.
14. Due to the general consumer usage behavior, efficient power distribution on the field, corporate environment responsibility by eliminating harmful substances such as carbon dioxide, sculpture dioxide, etc., and other unexpected risks, this product does not provide standby power option

Radio and Television Interference

UNITED STATES: The equipment described in this manual generates and uses radio frequency energy. If it is not installed and used in accordance with the instructions in this manual, it may cause interference with radio and television reception.

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy, and if not installed and used in accordance with these instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

1. Reorient or relocate the receiving antenna;
2. Increase the separation between the equipment and the receiver;
3. Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.

If necessary, consult your dealer or an experienced radio/TV technician for help and/or additional suggestions. You may find the following booklet helpful: **How to Identify and Resolve Radio-TV Interference Problems**, booklet number 004-000-00345-4, prepared by the Federal Communications Commission. It is available from the United States Government Printing Office, Washington D.C. 20402.

Note: Changes or modifications not expressly approved by the party responsible for compliance could void the user's right to operate this equipment.

Peripherals used in conjunction with this equipment must be connected via shielded interface cables. Use of unshielded interface cables may result in interference to radio and TV reception, and may void the user's right to operate this equipment.

Introduction

Thank you for purchasing Datavideo's SE-500 Digital Video Switcher. We hope you will be pleased with your purchase, and with what you can achieve with this advanced piece of technology. In order to get the most out of your new switcher, we recommend that you spend some time getting familiar with this manual, as it will describe in detail all the functions of this unit. In addition, you'll find some useful background information on video and audio, and some detailed examples of ways to use your new switcher.

If you are experienced in video production, you may want to immediately take a look at the **Quick Start** section on *page 11*

Product Overview

The Datavideo SE-500 is an analog input, digital processing video switcher. The SE-500 includes 4 groups of video input (4 x composite & 4 x S-Video), a 3 channel audio mixer, 2 microphone inputs, color correction, digital video transition effects, MIDI control interface, Tally out, RS-232 remote control interface…and many more professional features.

A built in TBC in each channel with YUV 4:2:2 frame synchronizer for Composite, and S (Y/C) inputs and outputs assures stable and high quality video from virtually any source. A built in R.G.B. Color Processor and a Color Corrector for each video input, with settings that are saved, allow you to fine tune your video. The SE-500 has 15 different digital effects, which include Quad, Split, PIP, Wipes, and Fade.

Additionally, the SE-500 includes a truly unique feature "Quad Preview." This preview output displays both tally light signals, and next video effects indicator. The operator can use one single monitor to observe four video input sources, camera activities, and video transition effects. The SE-500 has all the popular features of many more expensive mixers and it is extremely compact in size. Now you can shoot, mix, and edit, all within this compact size digital switcher.

With the Datavideo DAC-6 (DV to Composite, Y/C, and Component converter), VP-314 (DV Repeater), and 10, 20, 40meter DV cables, you may use DV cameras to feed video from up to 200 meters away.

Features

- Digital Processor, high image quality
- Four inputs of S-Video (Y/C) and composite video
- Quad video preview monitor output with tally & background indicators on screen
- Optional YUV output – via breakout cable
- Quad, Split, PIP, Wipe, and Fade digital video effects
- T-Bar control of digital video effect transitions
- Color processor for video correction
- RS232 remote control
- MIDI control interface
- Tally output
- Audio mixer with two microphone channels and one auxiliary input

What is a switcher?

A switcher is something or someone that allows or facilitates switching.
In this case, the switching that happens is among 4 video and 3 audio sources. And if just switching were the only requirement, then this piece of equipment would be like a row of light switches. But no: to be truly useful in a production environment, a video switcher has to provide for numerous ways to go from one video source to another (transitions), ways to adjust the look of the video (color processor and special effects), to deal with audio, and to keep the whole thing synchronized, looking good.

What is a frame synchronizer?

A frame synchronizer is a digital device that stores a frame of video in its memory and releases it at a very precise moment. These little devices are essential if you want to make a seamless switch from one video source to another. If the sources you are switching between are not synchronized with each other, the video image falls apart at the transition moment, and the result is not pretty.

The SE-500 has a full frame synchronizer (also known as a time base corrector or TBC) at its Main and Sub Source inputs in each channel (4 Total) to insure switches without distortion and smooth, well-regulated video at its output. In addition to its digital memory, a TBC also has controls that affect the look of the video that passes through it. These controls are known as processing amplifiers, or proc amps; they control brightness, contrast, color, and tint, though these may have different names in different applications.

For more information on some of these technical aspects, see the Appendix Tech Notes on *page 39*

Possible applications

You may already have some uses in mind for the SE-500. There's a real good chance that by browsing through this manual, you will find some applications you didn't think of or expect. Take a look at the **Sample Applications** section *(page 30)*; we describe 3 sample uses for the SE-500: Four Camera Shoot (Live Stage Performance/Sporting Event), Live Conference, and Live Event Mixing (Club VJ/Convert).

What's in the box?

1. BNC to RCA connector * 2
2. AC/DC Switching adapter 12V / 1.5A * 1
3. Instruction Manual * 1
4. YUV (BNC*3 to S+BNC) cable * 1

Installation, Connections, Set up

Some General Notes on Installation

There are a few other things to be aware of when you are installing and integrating the SE-500. Please make sure you have read the **Warnings and Precautions** section on *page 3.*

The SE-500 sends and receives analog signals except the RS-232, MIDI, and Tally. You need to be aware that cable lengths, impedance, crossing power cords, and adaptors might interfere with video transmission. The cautions below, with the exception of physical damage, will give you the general idea about cabling for analog video or audio.

It is quite possible these days to buy whatever cable length and connector you need for your set up. Not so long ago, they had to be assembled individually with wire strippers and solder, but now you can easily find them in most electronics and video supply stores. We strongly recommend you use analog video and audio cables that are roughly the right length to connect between components. The longer the cable, the more noise and deterioration of the video signal can be introduced. We strongly recommend that you check the integrity of each analog cable before installation by using a continuity tester (available from most electronic and video supply stores). Cables can go bad over time, with use, by someone walking on them, carts rolling over them, or even for no apparently good reason. It will happen eventually. Have a continuity tester handy and save yourself some troubleshooting headaches.

Make sure you don't run video/audio cables and power lines together, on top of each other, or across each other. This is another good way to introduce noise and signal degradation.

Cable connectors will eventually become dirty or oxidation will start. The dirt can cause a bad connection or introduce noise in the signal. Get some electrical contact cleaning products, such as those made by Caig Labs (www.caig.com), and use them regularly to avoid problems.
Use adaptors if you must, but keep in mind that each connector is one more accident waiting to happen, one more place the signal can be degraded or broken.

Finally, for some interesting and entertaining examples of how to connect and integrate the SE-500 into a variety of set ups, take a look at the brief **Quick Start** on *page 11* and the more in depth explanations in **Sample Applications** on *page 30*.

Power up State

When you first power up the SE-500, you will need to check each channel 's connection and set the audio levels. All the setting will be retained except color bar output, see "**MENU"** on *page 22*.

At power up, channel 1 will be the selected Main Video Source and channel 2 will be the selected Sub Video Source.

Settings that are retained are: color correction settings; remote control setting; transition setting; video effect setting and background color.

Connecting Video Sources

There are two types of plugs used for video signals on the SE-500: BNC, and S-video.

BNC connectors look like this on the cable end. The connector slides over the connector on the SE-500 and is locked in place with a push in and clockwise turn. The big virtue of these connectors, which are the standard for almost all professional video applications, is that they lock in place and cannot be accidentally dislodged.

BNC

S-video plugs (also known as Y/C) have 4 tiny pins in them, which carry a separated Y (luminance) and C (chroma) video signal and provide a much better quality video signal than composite. These plugs have a tiny bar in them to assure correct alignment in the socket. They need to be pressed firmly in place, but very carefully, as the little pins can bend easily. Align plug and socket and push straight in, firmly.

S-Video

Connecting Audio Sources

The SE-500 uses 2 kinds of plugs for audio connections: RCA and 1/4 inch jack plugs. There are lots of different names for these plugs. Fortunately for us all, they are not easily confused in the size and shape departments, so we'll show you some pictures.

RCA plugs (also sometimes known as phono plugs, cinch, or tulips) are used for line level audio, such as the connections between a CD player and amp. The SE-500 uses these in stereo pairs, white for left and red for right, at the audio input and output sections.

RCA

1/4 inch jack plugs got their name, some say, because they used to be used to manually patch together phone lines in the old central switchboard days. They come in mono and stereo configurations: the mono has one dark band around the plug, the stereo has two. The SE-500 uses a mono plug on MIC CH1 and mono plugs for MIC CH2.

¼ Mono Jack

If you need to use balanced audio inputs or outputs, for low impedance microphones or connections with other professional audio gear, you need to use an impedance matching device to convert low to high impedance (and/or vice versa). For example Datavideo BAC-03 *(on page 46)*

¼ Stereo Jack

Outputs and Monitors

Your particular set up and application for the SE-500 will determine what video and audio devices you connect to the outputs. Take a look at the **Sample Applications**, *page 30* for some examples. While all the outputs of the SE-500 are very high quality, keep in mind that the video quality of the various formats, in descending order, goes like this: SDI (serial digital), Y.U.V. (analog component), DV, Y/C (S-video), and composite. Audio outputs are all line level, suitable for connecting to an amp, VCR, or video projector (for example).

We can't stress enough the importance of good monitoring systems. If something doesn't look or sound right at the last stage of the signal path, the Main output, it can only be easily corrected if you can pinpoint where in the signal path the problem is being introduced. Certain set ups will benefit greatly by being able to monitor the video of each input channel, as well as the Main output. High quality headphones allow you to hear the audio with far fewer intermediate steps and far more accuracy, thanks to the Headphone control on the front panel, than going through an amp and speakers. We suggest both methods of monitoring, and listening to the sound through a video monitor's speakers is also a good idea. Needless to say, if you are outputting to a record deck, you should be able to easily monitor the output of that device as well.

Connecting a Datavideo TLM-70D 7" TFT LCD for preview video monitoring, page 45.

Audio Mixer

- An Audio Mixer with two mono microphone inputs and stereo Aux input allows you to adjust and balance the volume from various audio sources.

RS-232 control

- The RS-232 Control Port enables control of the SE 500 from a PC or other device thru the RS-232 port. Connects to PC RS-232 serial interface for remote controlled by PC application software. Refer to the Appendix detail of RS-232 Remote Control Protocol, *page 47*.

Tally control

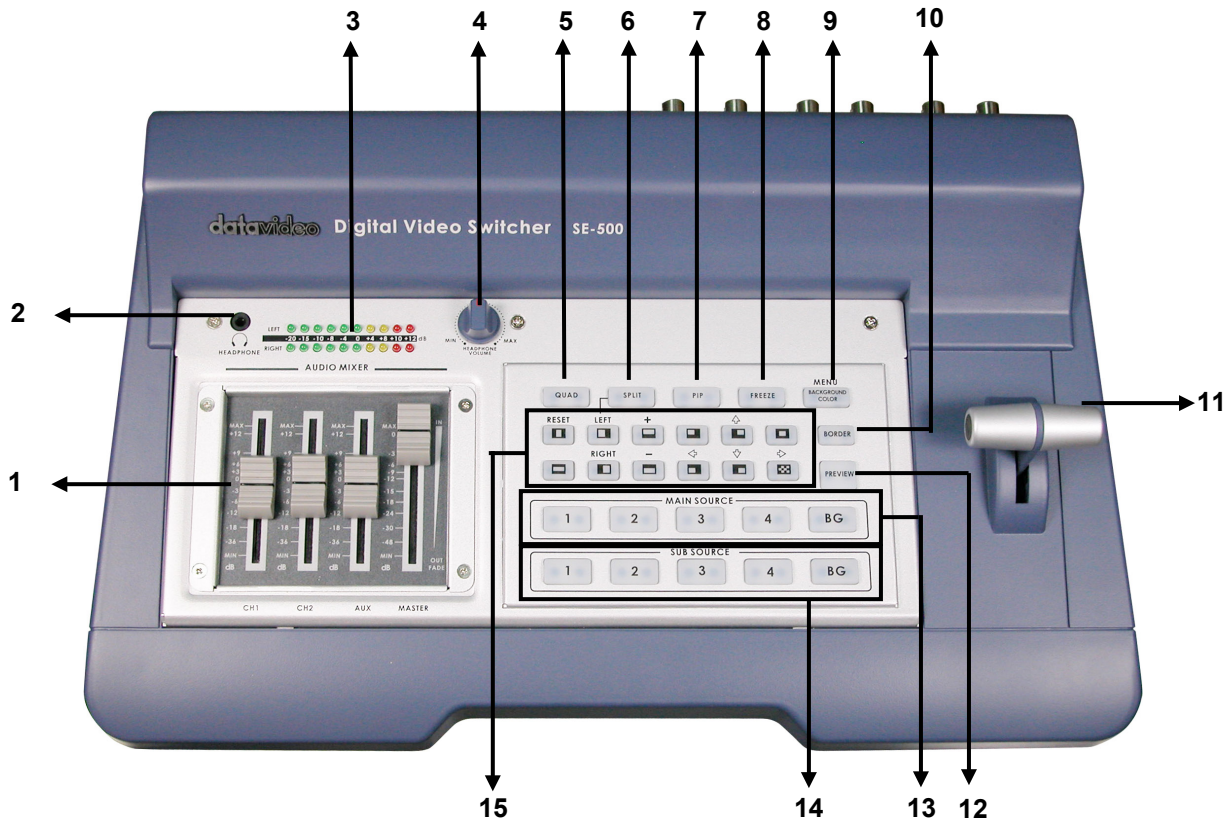
- The tally output allows you to send out tally light signals. Refer to the Appendix detail of tally pinouts' cross reference, *page 54*.

MIDI control

- Connects to other MIDI devices, such as MIDI keyboard, and electronic piano. Refer to the Appendix detail of MIDI Control Protocol, *page 52*.

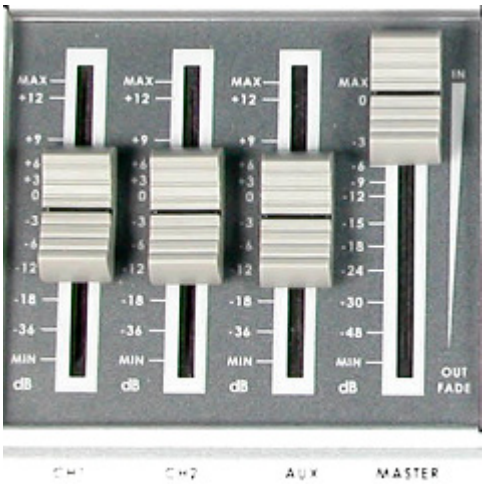
Quick Start

SE-500 Front Panel



1. Audio faders
2. Headphone
3. Audio meters
4. Headphone Volume Control
5. Video Effect: Quad
6. Video Effect: Split
7. Video Effect: PIP
8. Video Effect: Freeze
9. Background color selection/Menu
10. Border On/Off
11. T-Bar
12. Transition Effect preview
13. Main Video Source selectors
14. Sub Video Source selectors
15. Transition mode selectors

1. Faders: sliders to control audio levels for the Main audio output mix. These Audio Level pots are the first stage in the audio signal path. Analog audio comes in through the 1/4 inch phono jack and RCA connectors on the rear panel see **Rear Panel**, *page 15*.



2. Headphones jack: accepts a stereo mini jack plug for stereo headphones. The headphone volume is controlled by the Headphone volume control (**4.**).

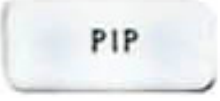
3. Audio Meters: LED style meters, which show the signal strength at the Audio Output. The signal measured is determined by the levels set with the Faders **(1.**). The LEDs turn red at +10 dB to indicate clipping distortion. For more information, see **Audio Inputs, Levels, and Meters**, *page 23.*

4. Headphone volume control: controls Headphone level and signal(s) present at the Headphone jack (**2.**). Level is controlled by the rotary knob. For more information, see **Outputs and Monitor**, *page 18* and **Audio Inputs, Levels, and Meters**, *page 23*.

5. Quad Video Effect: combines four different input sources into one single output on program monitor.

6. Split Video Effect: split the selected Sub Video Source and the Main Video Source into left and right half size video screen. Use left and right function key to swap sides. For more information, see **Using Effects: Split**, *page 28.*

7. Picture in Picture: puts the selected Sub Video Source in a window on the Main Video Source, with control over window size and placement. Used in conjunction with the Border keys (**10**.) For more information, see **Using Effects: Picture in Picture**, *page 28.*



8. Freeze Video Effect: will grab the last field from the Main video output and hold it as a still image. For more information, see **Using Effects: Freeze**, *page 28*.

9. Background: When Background is selected in either the Main or Sub Video Source (**13, 14.**), and the button is pressed (and the LED is lit except with black color background), repeated presses of the color button cycle through the 8 possible solid backgrounds. For more information, see **Background**, *page 29*.

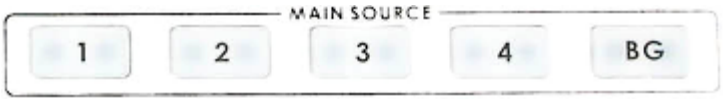
10. Menu: Press and hold the button “BACKGROUND COLOR” for 2 seconds or more, a menu will pop up. You are able to change the camera settings, which include Brightness, Contrast, color, Tint (NTSC only), 0 or 7.5 IRE, YUV or S-video out, and color bar output. For more information, see **Color Processor**, *page 21.* Press it again and you can change output format, MIDI control, and color bar output.

11. Border: controls the border style and color for the Picture in Picture effect, and the color edge for the Wipe effect. This control is accessible when the Picture in Picture controls, and Wipe transitions (**15.**) are engaged. For more information, see **Using Effects: Picture in Picture,** *page 27* and **Using Transitions: Wipe** *page 24.*

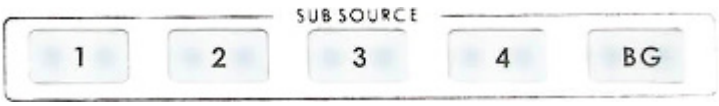
12. T-Bar: used to manually perform a transition. For more information, see **Playing a Transition Manually**, *page 24.*

13. Preview: preview the selected transition effect, and background color by pressing the “Preview” button.

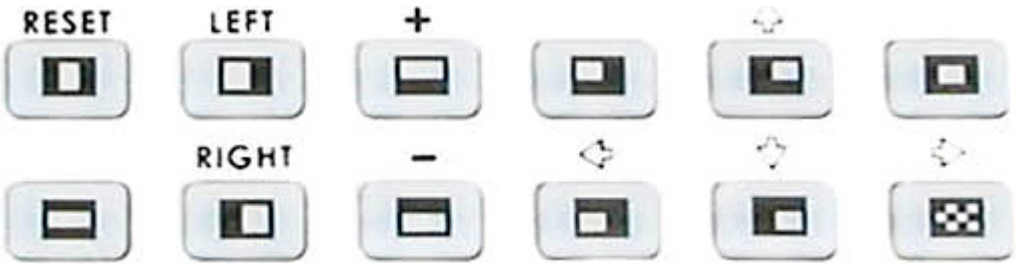
14. Main Video Source Selector: Used to select which of the four video input channels or background is sent to the Main video output. For more information, see **Video Source**, *page 20.*



15. Sub Video Source Selector Used to select which of the four video input channels or background will be transitioned to or used as a sub source in an effect.

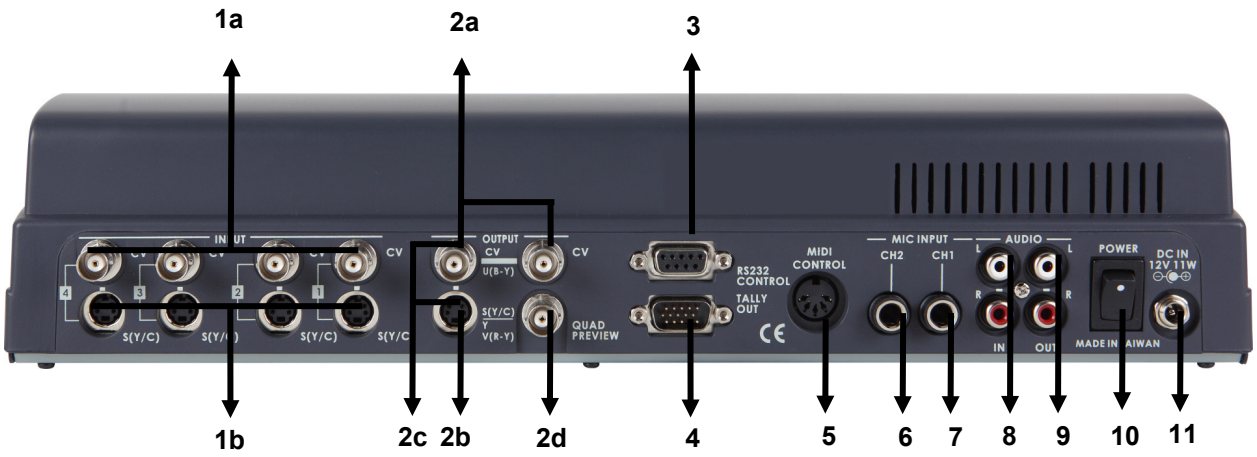


16. Transition selectors: These twelve selection buttons determine the transition type and allow for the selection of certain effects that are performed on the selected Main Video Input channel. For more information, see **Using Transitions**, *page 24* and **Using Effects**, *page 27.*



Tech note: Transcoding is the act of changing video from one format to another, for example, from composite video to S-video. The SE-500 has been designed to perform transcoding, as part of its standard operating procedure. Select a video source on the Main Source Input bus, and it will be available at the Main Output in all formats, S-Video and Composite, simultaneously. With the exception of component (YUV) and S-video (Y/C): only one of these output formats is available at a time.

SE-500 Rear Panel



1. Video inputs, Channels 1, 2, 3, 4.
   1a. S-Video (Y/C) input
   1b. Composite video input (BNC)
2. Video outputs
   2a. Composite video out (BNC)
   2b. S-video (Y/C) out
   2c. Component (Combine Composite & Y/C with a breakout cable)*
   2d. Quad preview output (BNC)
3. RS-232 Control
4. Tally Signal out
5. MIDI Control*
6. Microphone input Ch2 (1/4” jack)
7. Microphone input Ch1 (1/4” jack)
8. Audio inputs (Stereo, RCA connector)
9. Two Stereo Audio outputs (RCA)
10. Power switch
11. DC Power input 12V

1. Video In (Channels 1, 2, 3, and 4 are all set up the same way)
   a. Composite video input: takes a BNC connector from the composite output of a VCR, camera, DVD player, etc.
   b. S-Video (Y/C) input: takes a standard 4 pin S-video cable from the output of a VCR, camera, DVD player, etc.

2. Video Output. These ports carry the Main video output of the SE-500.
   a. Composite video out: BNC connector typically connected to a program monitor.
   b. S-video out: standard 4 pin S-video (Y/C) connector, typically connected to a VCR, projector, or monitor.
   c. Y.U.V. video out: Combine Composite & Y/C with a breakout cable. These BNC connectors carry the analog component Main video signal, and would typically be connected to a master recorder (Betacam, DVCPro, or DVCam, for example), component video monitor, or a satellite uplink. (See **Video Sources,** *page 20* for more information on connecting these ports to a device.)
   d. Quad preview out: BNC connector carrying a quad video signal with effect, Tally light, background, and speed indicators.

3. RS-232 control: for PC or other devices to remote control via RS-232 protocol. Please read the Appendix of RS-232 Protocol on *page 47* for more information.

4. Tally Out: send out Red, Yellow, and Green colors tally signal to each channel. Red means On-Air, Yellow means next camera source, Green means free to move.

5. MIDI Control interface: for connecting to other MIDI devices, such as MIDI keyboard, and electronic piano. Please read the Appendix of MIDI Control Protocol, *page 52*

6. MIC CH2: A ¼" jack connector for a high impedance analog audio source, such as a microphone. MIC inputs 1 and 2: accept ¼" Inch mono plugs, carrying high impedance signals from one or two mono microphones. With high impedance MIC, the longer the cable from microphone to the SE-500, the more noise is introduced into the signal.

7. MIC CH1: When a stereo ¼" jack is connected to CH1 only, the CH1 and CH2 **Faders** (page 12) will have equal volume on each channel. When both CH1 and CH2 have a MIC connected, each fader channel will adjust the respective input from the rear panel.

8. Audio Inputs: A RCA stereo for a line level auxiliary analog audio source, such as a CD player or tape deck. If you are using more than two sources via an external audio mixer, connect the audio mixer's line level output to this unbalanced Audio input.

9. Audio Output: A RCA stereo line level analog audio output, carrying the signal present at the output of the audio mixer section (see **Controls and Operations**, *page 20)*.

10. Power: Switches the unit On / Off.

11. DC Input: connect the power supply that came with the SE-500, and only the power supply that came with the SE-500, here, and plug the other end into an electrical outlet, preferably on a surge suppressor (to protect the SE-500 from random power spikes that can fry its delicate insides).

Selecting video input formats and adjusting audio levels

(Numbers refer to the Front Panel illustration above)
*. Verify that there is a valid source at each input you've connected by using the Main Source Select buttons (**13.**) to select a channel and view the output on the main monitor.
For each input channel (1, 2, 3, 4): connect either a Composite or S-Video source to each channel. For more information please see below.
Adjust any audio input levels you will be using, for example microphones, Aux in from a mixer, etc. Set the level of the LEDs in the Audio Meters (**3.**) to occasionally peak at +8 or +10 and there is no audible distortion.

Tech Note: SE-500 will automatically detect which connector is plugged. Therefore, there is no need to change the setting when you switch the video source from S-Video to Composite, and vice versa. However, if you connect both S-Video and Composite inputs on the same Channel, the SE-500 will automatically select the S-Video as main input source.

Using Video and Audio Monitors

Without reliable video and audio monitors, you won't be able to tell what's what in your mix.
The SE-500 provides the ability to easily and reliably monitor video and audio at the output stages.
All video input channels can be monitored on one monitor, via the Quad Preview Monitor Output, *page 16*.

You should have a video monitor displaying the Main Output. This could be a composite monitor, for example, connected to the one of two CV plug (Composite) in the Video Output section (**2a,** *page15*), or to the composite output of a VCR connected to the Video Output.
For output audio monitoring with headphones, set the rotary headphone volume control knob to the center. (**4.**); to monitor through an amplifier and speakers, push the MASTER fader to -12 in the Audio Faders (**1.**) section. For more information, see **Controls and Operations**, *page 20*.

Cutting between sources

The simplest way to cut (switch) between source video inputs: use the Video Main Source buttons (**13.**) to select which input goes to the program monitor (output). Look at the results on your program or record monitor.

Dissolving between sources

Select the Main Video Source (**13.**) by pressing the appropriate channel button. The LED for the channel you have selected should be lit and you should see that source on the program monitor.
Select the Sub Video Source (**14.**) you want to dissolve to.
The default transition is fade (The LED should be lit when you turn on the switcher. If a different transition is selected at power up, press it to deselect.) Move the T-Bar (**11.**) to the opposite position and watch the fade happen on the program monitor. You can stop the fade part way through and watch the Main source fade away.

Other transitions between sources

Select Main and Sub sources as above.
Select the wipe you wish to use. There are total 11 different Wipe styles and the corresponding icon will be displayed on the preview monitor when you press it.
At this point you can hit Preview (**12.**), to see the transition on the preview monitor. Then, use the T-Bar to perform the transition manually.
For more information, see **Using Transitions**, *page 24*.

Effects

There are two places on the SE-500 where you can add effects: in the Transition Effects section (**15.**) and in the Video Effects section (**5-8.**). Some of these work on a single source, and some need two or four sources to work.

Select a Main Video source and try the following:

In the Transition Effects section, select the WIPE effect you wish to use. You could also add a border to the edge by turning on the **BORDER** effect (**10.**).

For more information, see **Using Transitions**, *page 24*

In the Video Effects section, try the Quad effect (**5.**). Press the button to engage the effect; the LED will light. You can see 4 input sources showing on the program monitor at the same time.

For Split effect (**6.**), select a sub source for right hand side window. Then, press the “SPLIT” button. You will see Main source on left hand side, and Sub source on right hand side.

PIP effect (**7.**), which stands for Picture in Picture. As you might guess, this effect requires a Main and Sub Video Source. Assuming you have valid inputs on Channel 1 and 2, select Channel 1 as the Main Source and Channel 2 as the Sub Source. When you engage the effect by pressing the PIP button (and verifying that the LED on the button is lit), on the program monitor you will have Channel 1 as the Main Source and Channel 2 as a smaller window inset. There are two choices for window size. Change these by pressing the ＋ and － buttons, see below. You can position this window using the other five different position buttons on (**15.**), with the button set to Position Control (LED is lit). You could also add a border by turning on the Border control (**10.**).

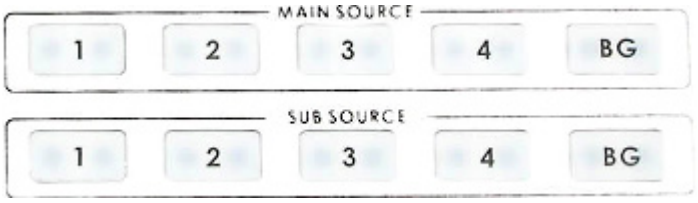
Next, try the Freeze effect (**8.**) to grab a still frame of the Main Source video. Move the T-Bar to manually dissolve to the Sub Video Source.

For more information, see **Using Effects**, *page 27*

Controls and Operations

Video Source

Selecting the Main and Sub Video Sources is the first thing to do when setting up the SE-500.



The source you select (by pressing one of the buttons; a bright red LED on the selected button lights for confirmation) on the Main Source bus is what is sent to the Video output. This means that you can perform cuts between sources by simply pressing different buttons.

The Sub Source selection determines which input will be transitioned to when using any of the transition controls (Wipe and Fade) and provides the video for Picture in Picture and Split functions. (See **Using Transitions**, *page 24*, and **Using Effects**, *page 27* for more details.)

In addition to selecting which video input channel will be present in the Main and Sub Source busses, you must check the appropriate input for each channel in use. (See **Selecting video input formats and adjusting audio levels**, page 18.) The SE 500 has automatic input select; if there is an S-Video cable connected to the S-Video input, the channel will automatically switch to S-Video input. However this means that, if both composite and S-Video inputs are connected and there is no valid video signal present thru S-Video, you will see a black video when that channel is selected for output. For example, if you have a camcorder connected to channel 1 through the composite input, and you also have channel 1's S(Y/C) connected to another non-working device, you will see a black video, even if the camcorder is supplying a signal. You will also see a black video if the camcorder is not supplying a video signal, such as when it is powered off, or in playback mode with no tape loaded.

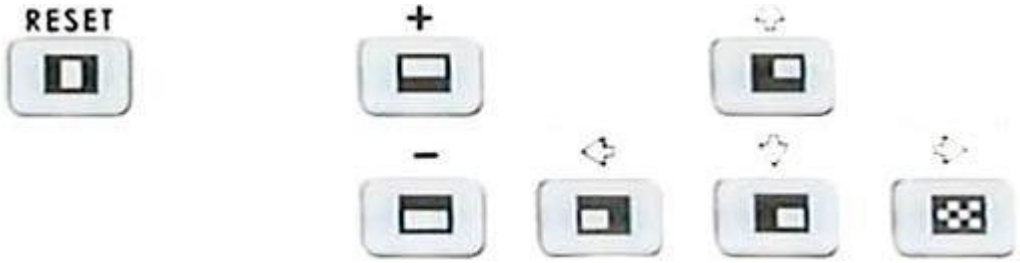
Tech note: The frozen image is a function of how the time base corrector (TBC, a.k.a. frame synchronizer) works. The SE-500 has a TBC at the Main Video Source and the Sub Video Source input on each channel. Their purpose is to stabilize the video signals as they come into the switcher, and to synchronize their timing so that they can be switched and otherwise combined with no disruption to the video signal. For more information on TBCs, see **What is a frame synchronizer?** *Page 6*.

Color Processor

The Color Processor controls work when you press and hold the "**Background**" (**9.**) button for 2 seconds or more, which is temporarily displayed at the Preview Output. For more information, please see the "**MENU**" section. These controls are like picture controls on a video monitor or the proc amp (processing amplifier) controls on a time base corrector. In fact, they are the proc amp controls of one of the SE-500's 4 internal TBCs.

On the top of screen you can see 4 different numbers, each represent the input channel from the SE-500 rear panel. On the left side of this section are the 4 controls (Brightness, Contrast, Color, and Tint (NTSC only)). 0 stands for Unity, or perhaps Unchanged. In either case, it shows that the signal passing through that particular control is being neither boosted nor cut. To move to another control, press the **up** or **down** arrow button. To move to another channel, press the **left** or **right** arrow button. To change the settings, press the ＋ or － buttons.

	1	2	3	4
Brightness	±0	±0	±0	±0
Contrast	±0	±0	±0	±0
Color	±0	±0	±0	±0
Tint*	±0	±0	±0	±0



You can see the extent of color processing available in this section by experimenting with the controls. Brightness adjusts how light or dark the colors in the image will appear at the Video Output. The Y-Gain controls affect the range between the lightest and the darkest parts of the image, including how much shadow and highlight detail can be seen. Color controls the saturation or intensity of the color image, from fully saturated or extremely intense at the top of the scale to completely de-saturated or monochrome (black and white) at the bottom. The Tint buttons (NTSC only) control the actual hue or specific colors in the image, in effect rotating all the colors equally around an imaginary color wheel.

Reset works on the selected input source, and when pressed and held for 2 seconds, resets the Color Processor controls for just that input to 0 or unity. (Press and hold the Reset button until you see the image shake a bit and return to it's unprocessed state.)

So how do you know for certain how effective any of these adjustments are? You can see the changes by looking at the Main Output on a video monitor, but how do you know if that reference is accurate?

The first part of the answer is: by having an accurately calibrated monitor that shows exactly, with reference to a standard, what the video looks like. That standard has been described and agreed to by the Society of Motion Picture and Television Engineers (SMPTE) and the European Broadcasters Union (EBU), and is most commonly shown as "color bars." Color bars are an image consisting of columns and blocks of specific colors and gray tones. Because of differences in television standards, SMPTE bars and EBU bars do not look the same. They are used in much the same ways: when these are displayed on a monitor, the monitor can then be adjusted to meet the standard.

The most serious, accurate color correction is done with the aid of a waveform monitor/vector scope, a signal analysis instrument (actually a pair of instruments) common in video editing suites, which shows precisely the details of the video signal. With one of these instruments, you can see at a glance (once you know what you are looking for) the most intimate electronic details and irregularities of the video signal.

Many users may not have access to a waveform monitor or vector scope, but this does not necessarily condemn them to produce less than high quality video. It means that more care must be taken and some different procedures must be followed.

Nothing will take the place of a calibrated, properly adjusted monitor, so that must always be your first step. For more information on monitor calibration procedure, see **Appendix: Monitor Calibration**, *page 40.*

If you don't have any video test equipment, follow the suggested procedure to adjust all the video sources, which is described at the end of **Appendix: Monitor Calibration**, *page 40.*

Settings made in this section are "remembered" by the SE-500 after you power down the unit. In other words, these settings remain in effect until they are changed or the Reset button is pressed.

MENU

The MENU works when you press and hold the "**BACKGROUND**" (**9.**) button for 2 seconds or more, which is temporarily displayed at the Preview Output. The first adjustment is the "Color Processor" as described above. Press the button again, and you can select IRE, video output format, remote control protocol, and color bar output. Use the **up** or **down** arrow keys to move to different categories, and then use ＋ or － to change the setting.

You may select YUV and CV (Composite) for video output format, and use a breakout cable to get a Component output signal.

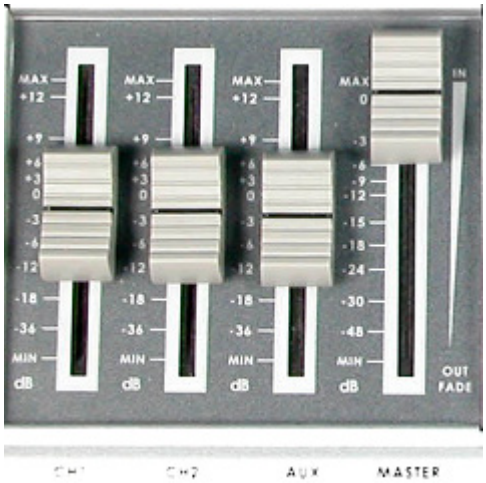
If you use a MIDI keyboard in live concerts, you will be amazed what the SE-500 can do. Go to "Remote Control", use ＋ or － to change the setting from RS-232 to MIDI. Press "**BACKGROUND**" again, select the desired MIDI channel you wish to use. While you are setting the channel on the SE-500, please also set up the channel on your MIDI device. After you finish setting, press the button again. Turn off the unit, and then turn it back on. Now you can start to use the MIDI device to control the SE-500. For more detailed information on MIDI control protocol, please refer to *page 52*.

Tech Note: All the setting will be memorized except color bar output.

Audio Inputs, Levels, and Meters (Faders, bus selectors,)

Audio Input Level Calibration Procedure

The first step in setting up the audio for a session with your SE-500 consists of adjusting the levels on which channel you will be using. Push the Master fader to Max, and set the other faders to 0. Then, listening to the audio and watching the Audio Level Meters (see below), set the level with the fader so that the sound is consistently at between +0 dB (green LED) and +8 dB (yellow LED) and just barely peaks occasionally to +10 dB (red LED). The idea is to avoid any audible distortion (clipping), caused by making the signal level too high at this stage.



Three faders on the left represent the input volumes (CH-1, CH-2, AUX), which determine what signals are present at the Main Output. If any of the faders are all the way down, there will be no audio from that input channel heard at the output.

These faders correspond with each input and control the relative volume of each input in the master output as well as the master output level. When the faders are set to 0, they pass the audio signal through at the same level it was at when it entered this bus. You can increase or decrease the volume of each channel by moving the fader up or down.

These meters show the audio signal level at the Main output. The strength of any audio signal that is routed to the output will be displayed here. As mentioned above, these meters play a vital part in correctly setting the audio levels to avoid clipping or other distortion. You'll notice that the LEDs are green up through the +0 dB level, turn yellow at +4 dB, and turn red at +10 dB. As you set the audio level for each input, make sure that the signal peaks to +8 dB or very occasionally to +10 dB. Every time the signal goes to +12 dB, it will be distorted.

Use the Headphone section to accurately monitor with the "Master" volume output. In many cases, headphones may be a more useful and accurate choice than speakers for audio monitoring. For example, in a noisy club or at a concert, you won't be able to hear any additional sound coming through speakers. Headphones will also more accurately reproduce the sound you wish to monitor at a lower cost than speakers.

Using Transitions

The SE-500 can do 3 kinds of transitions: cut, fade, and wipe. The cut is a simple switch from one input source to another, and can be accomplished by selecting a source on the Main Source Bus, and then selecting a second one. One source is replaced by the next at the video output. Not flashy, not fancy, nothing to customize, but gets the job done. In fact, if you watch a film or video, paying attention to transitions, you'll see that the cut is far and away the most often used transition.

When you want a transition that is more stylish or fancy, see the next section.

Selecting a transition: Fade, Wipe

First, some definitions:
A fade, also known as a dissolve, is a transition wherein all the pixels of one source are replaced by all the pixels of another, at a smooth rate, and at the same time.

In a wipe transition, the change from one source to another happens along a predefined edge. It is like one source is being pulled back or pushed on to the other.

But a picture is worth a thousand words, so...
Select a main source and sub source, select Wipe, or Fade from the buttons above, press "**Preview**" button to see what it would like on program. Then, perform the actual transition manually by moving the T-bar up and down. See below for a list of transitions and variations.

Playing a transition manually

The T-Bar is the traditional switcher device for performing transitions manually; it can be either all the way up, all the way down, or anywhere in between. The up and down positions are relative, meaning one position is before and one position is after the transition.

The T-Bar performs the selected transition between the selected sources as fast as you move the T-Bar. And it performs as much of the transition as you want.

If no transition is selected, moving the T-Bar performs a fade between the selected sources.

Playing a transition automatically

The auto transition can be performed by RS-232 or MIDI control. In the auto-take, there are three different speeds you could select. For further detail see **RS-232 Remote Control Command** on *page 47* and **MIDI Remote Control Command** *on page 52.*

List of transitions and parameters (suitable for photocopying)

Wipe (works in conjunction with Border controls):

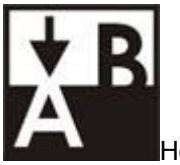
1: Block wipe from center to full screen.

2: Right angle wipe on, upper right to lower left

3: Right angle reveal, lower right to upper left

4: Right angle wipe on, upper left to lower right

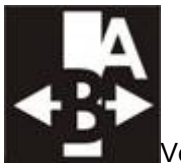
5: Right angle reveal, lower left to upper right

6:  Horizontal wipe, top to bottom

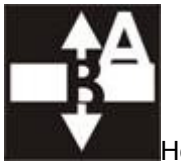
7: Horizontal wipe, bottom to top

8: Vertical wipe, left to right

9: Vertical wipe, right to left

10: 

Vertical wipe, middle to left and right

11: 

Horizontal wipe, middle to top and bottom

Using Effects

The SE-500 is capable of producing a wide variety of digital effects. These falls into 2 categories: single channel and dual channel effects.

Single channel effects are produced on the source selected in the Main Video Source bus and need no second video input. Single channel effects include Freeze.

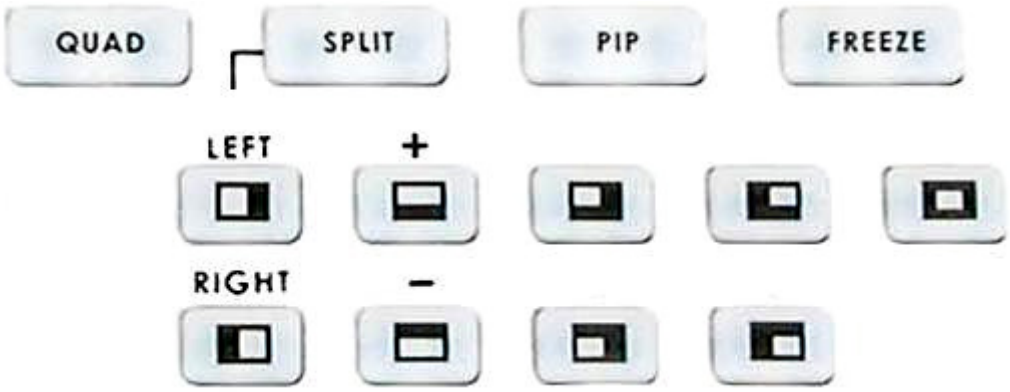
For example, select any input channel having a valid signal as the Main Video Input. Press the Freeze button once. You'll see, on the program monitor, that the source video stops instantly. Press the button again, and watch the source video return to full motion. With the Freeze effect, there are no parameters, just a single source stopping and starting.

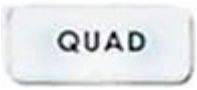
For more information on single channel effects, see the appropriate section (Freeze) below.

Dual channel effects are produced on the source selected in the Main Video Source bus and require a second source, which is always selected in the Sub Video Source bus. Dual channel effects include Picture in Picture.

For example, select Main and Sub Video Sources, and then press the PIP (Picture in Picture) button; immediately, on the program monitor, you will see the Sub Video Source in a small window.

For more information on these dual channel effects, see the appropriate sections (Quad, Split, and Picture in Picture) below.





Effects: Quad

The Quad effect combines 4 input videos into 1 output. When this effect is activated, it shows 4 video sources on 1 single monitor. Each source takes one quarter of the entire screen. Press the button again, and it returns to the previous selected source in full screen.

This is a dual channel effect, and cannot be used with any other transitions or effects.

Effects: Split

This effect will squeeze the Main Video Source and Sub Video Source into a half size screen. The default setting is Main Video Source on the left, and the Sub Video Source on the right. Select different sources for the left window by pressing different channels on the Main Video Source. You could switch from left to right, or right to left by pressing the “LEFT” or “RIGHT” button. You could also select different sources for the left window by pressing 1-4 channel on Main source or pressing 1-4 channel on Sub source for right window.

Effects: Picture in Picture

The Picture in Picture effect puts the selected Sub Video Source in a window on the Main Video Source. Variables for this effect include window size and position. Engage the effect by pressing the Picture in Picture button and verifying that the LED on the button is lit.

Window size (2 sizes are available); change the window size by pressing the ＋ and － buttons on the left of the Wipe transitions. (＋ is larger, － is smaller).

There are 9 different positions that are located on the right of the Wipe transition effects. Select from one of the preset locations by using the buttons. On each corner, use “Right” and “Left” to move the window closer to the edge or to the center.

This effect may also be used in conjunction with the Border keys (see below).

This is a dual channel effect, and cannot be used with any other transitions or effects.

Effects: Freeze

This effect freezes the incoming video, as selected on the Main Video Source Bus. There are no parameters, no variations. Press the button once and the video freezes, press it again, and it returns to the selected source in full motion.

The Freeze effect is single channel, and can work in conjunction with any transition.

Border

These controls are used in conjunction with the Picture in Picture Effect and Wipe transition only, and can only be activated when the Picture in Picture or Wipe control is active.

8 Colors are available for the border: black, blue, magenta, red, green, cyan, yellow and white. See “Background Color” below. (Wipe only. In PIP mode, the border is set to white color only.)

Background

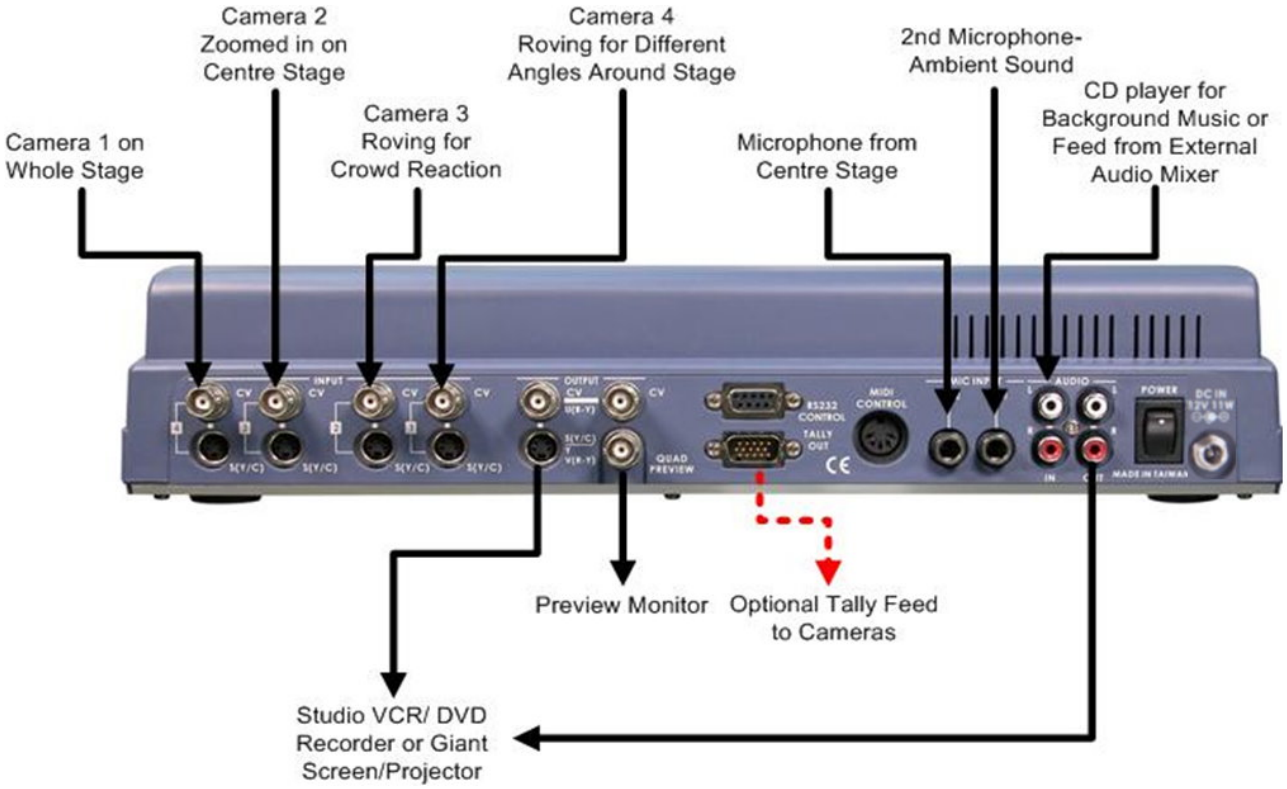
While not strictly an effect, these controls are in the same general area, and we thought you’d look here for any information you might need. These controls select what solid color the background will be when selected on either the Main or Sub Video bus. There are eight possible background colors; see below, with the identical LED lights displayed and the indicator on the preview monitor output.
The background colors are: black, blue, magenta, red, green, cyan, yellow, and white.
Engage this control by pressing the button in this section. The LED’s color will correspond with the background color (except black) to indicate that the controls are active. Repeated presses of the button select different colors.

Sample applications

We figured, being practical minded, that the best way to show off what the SE-500 can do is to give you some examples of how it could be used in real life situations. Each example refers to a block diagram for set up and connections.

Each of these examples is meant to illustrate a typical type of use for the SE-500. Needless to say, there will be many variations on any of these themes. Try to look for the principles of each set up and adapt these to your particular situation. As you get deeper into working with your SE-500 in different situations, you should familiarize yourself with the **Tech Notes,** *page 39,* **Accessories** sections**,** *page 44*, and **Appendix**, *pages 36* for a quick index of how to do various things with your digital Switcher.

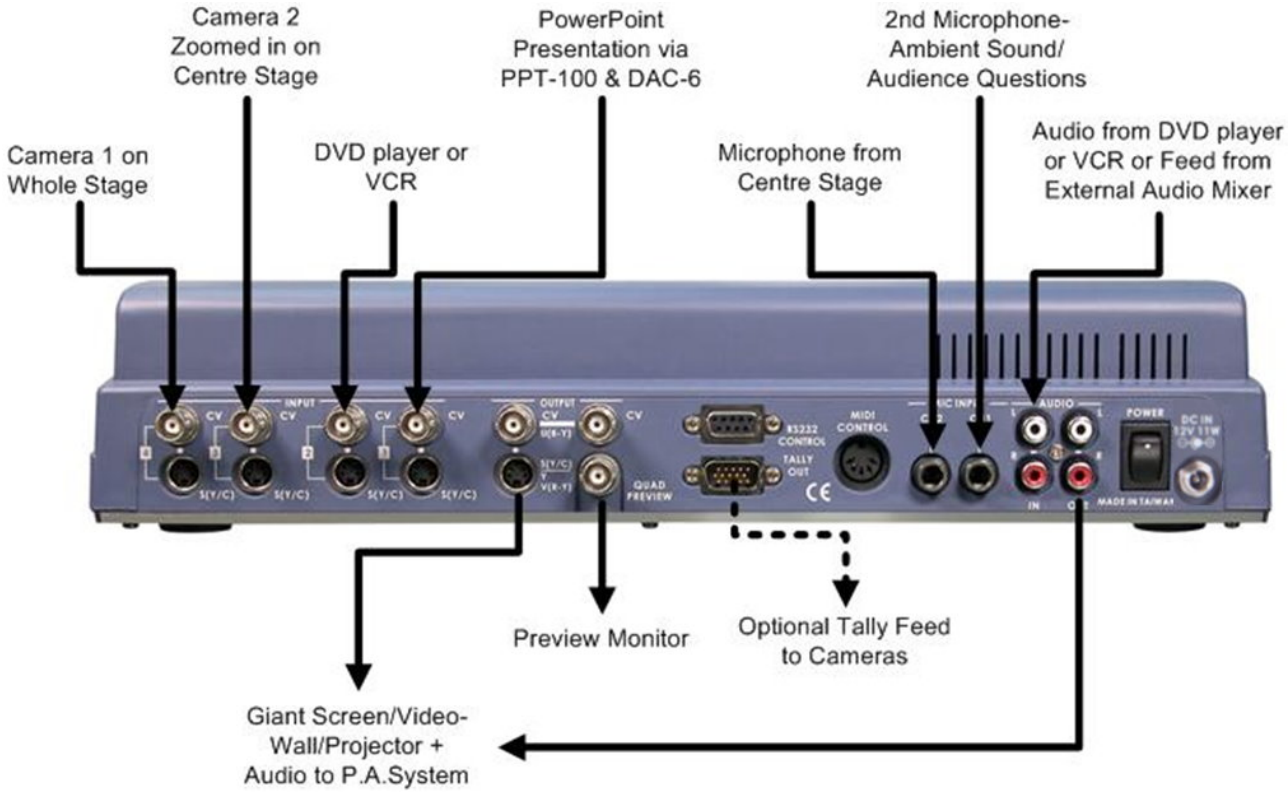
Four Camera Shoot: Live Stage Performance / Sporting Event



The first example is a typical four-camera shoot. The example is based on a stage performance such as a play or a band, but it could just as easily be slightly modified for other live situations such as sporting events. The four cameras are feeding analogue signals to the SE 500, via Composite or S-Video. It would be possible to use DV cameras by adding a Datavideo DAC 6 to each of the channels that you want to run DV. With four cameras it may be worth using the Tally Light feed, so that the camera operators will be aware when they are live, or save to re-position.

Depending on the complexity of the shoot, you may want to use an external Mic/Audio Mixer to handle the audio and then channel the output of the audio mixer to the SE 500, or simply use the two Mic inputs and have an audio source, such as a CD player for background music. If you shooting a sporting event the main microphone would be the commentator and the second Mic would be crowd noise.
The output can be recorded live to tape or DVD, or alternatively it could be sent to a giant screen or projector. The vision mixer operator will be responsible for ensuring the right camera feed is selected and that switching from camera to camera is carried out at appropriate times.

Live Conference



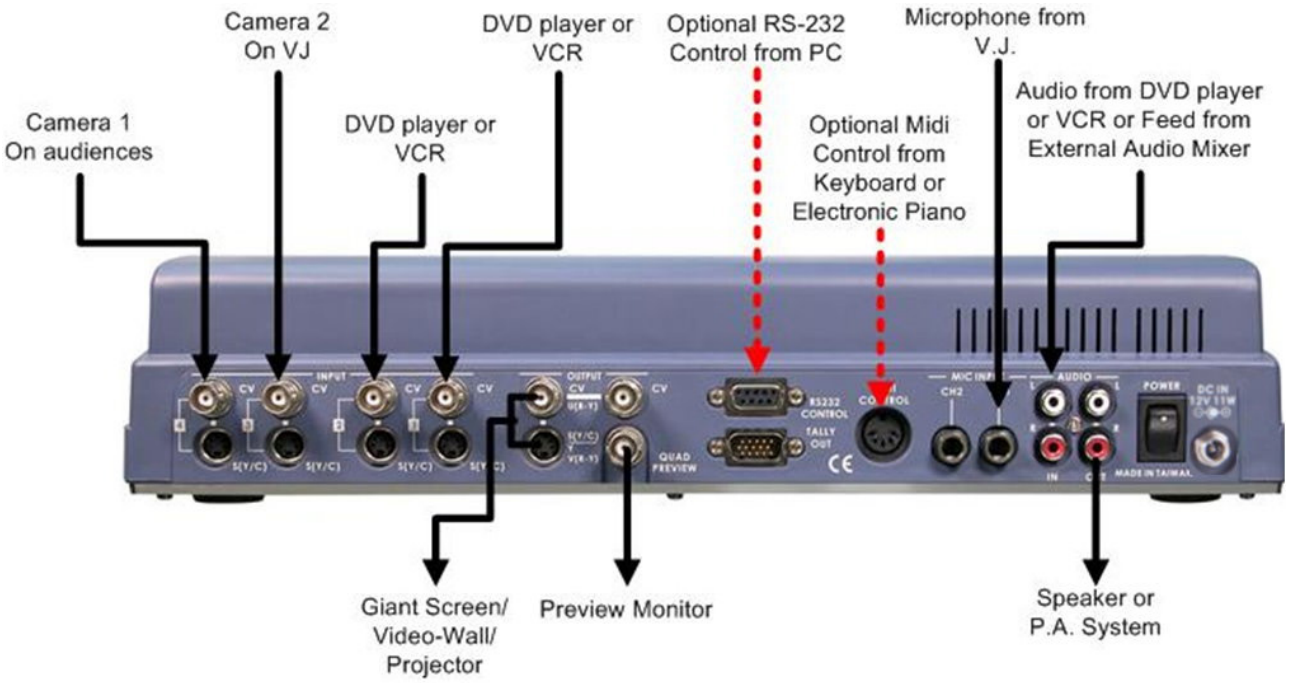
In this second example we see a typical conference set up.
There are two cameras to handle the speaker and the overview, with audience reaction or other action on the stage. Both cameras are analogue, but by adding a DAC 6 to any of the channels it would be possible to use a DV camera.

There is a VCR or DVD player cued up with footage to enhance the speaker's presentation, and a feed from a laptop of a PowerPoint presentation that the speaker will be referencing throughout his speech.
There is a microphone feed from centre stage, and the possibility of a second microphone for ambient sound or perhaps to field questions from the audience.

The output can be fed to a giant screen, video-wall or projector; the audio output can be fed to the P.A. System.

In this situation the vision mixer operator will take cues from the speaker for when to introduce the video footage and PowerPoint presentation. The operator will also control the volume levels of the two microphones and the audio feed from the VCR / DVD.

Live Event Mixing: Club VJ / Concert



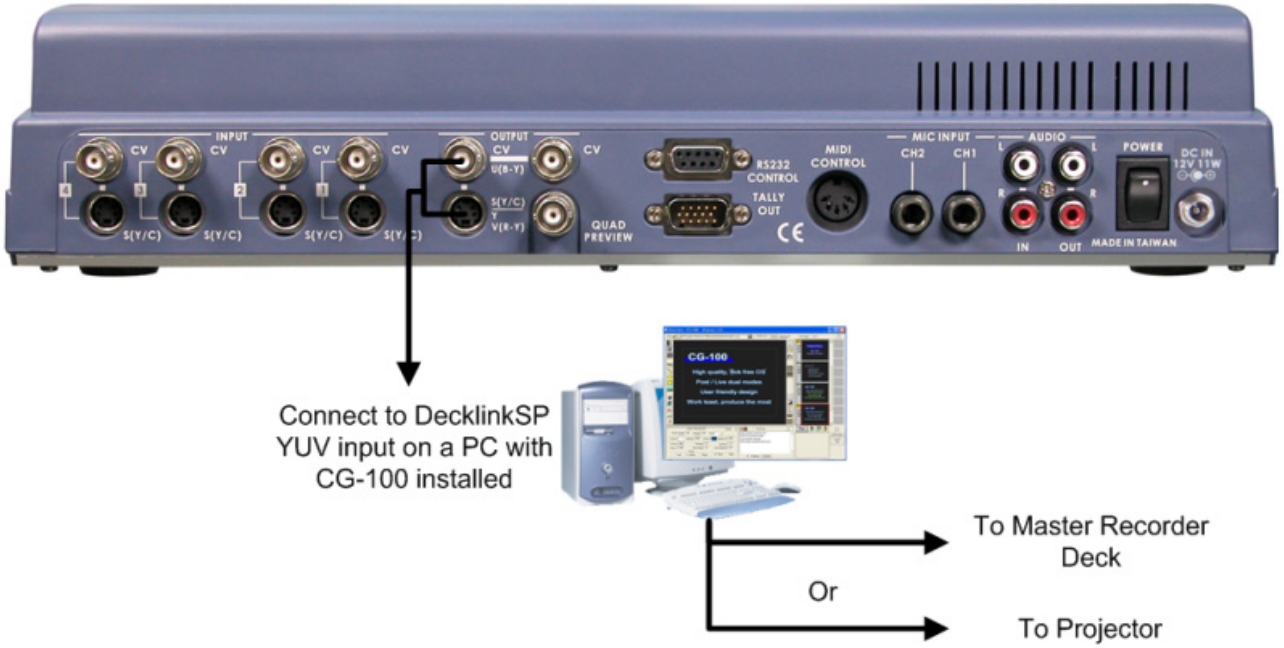
In our final example we are looking at a typical V.J. set up. Increasingly in clubs video images are used to add to the overall effect and atmosphere, they are combined with light displays and other audio / visual effects.

In the set up above we see two cameras being used, one on the audience and the second on the V.J, it could just as easily be a second angle of the audience.

There are two DVD or VCR sources, these could be showing animated patterns or backgrounds, promotional videos, music videos, just about anything. The audio from one of the DVD decks is being fed into the aux audio input; although it is more likely you would run both the DVD player audio feeds into an external audio mixer, together with CD players, keyboards and other audio feeds. The mixed output from the audio mixer would then be fed into the SE 500.

The job of the V.J is to control everything that is seen and heard. Combining video and audio images together in an entertaining way. It is possible the V.J may control the SE 500 via MIDI control from a Keyboard, or sequences the whole show via RS 232 and run it all from a PC.

Using SE-500 with CG-100 for Titles/Graphics/Logos overlay



Using YUV output (with a breakout cable) on SE-500 to communicate with a PC with Decklink SP CG overlay card and CG-100 CG software *(page 44)* to perform a text overlay for the output video.

Troubleshooting

No power
No image at output
Audio clipping
Audio or video feedback
Frozen image at output
Image distortions

- **No power**
  1. Check that the power supply is plugged into the SE 500, and to a suitable mains outlet, and that it is switched on.
  2. Move the SE-500 to a cooler location and allow the unit time to cool off before powering on again.

- **No image at output**
  1. Incorrect video input format selection
  2. Check that the output format is set correctly for S (Y/C) or Component.

- **Audio clipping**
  1. Audio input level is too high.
  2. Incorrect calibration of audio input level.

- **Frozen image at output**
  1. The Freeze function was activated
  2. The video input source is no longer valid, or playback has stopped.

- **Image distortion**
  1. The video input level is too high
  2. The video quality is poor from video input source.

Appendix

Glossary of Terms

Analog video: a video signal that is recorded and played back using changes in magnetic levels recorded on a tape or disk, e.g., the video we see when we watch a VHS videocassette.

Animation: a video or film sequence that gives the illusion of motion by presenting a series of images or photographs.

Balanced audio: a 3 wire circuit for audio, with the 2 legs of the circuit balanced with respect to ground, usually terminating in a 1/4" phone or XLR connector, having excellent noise rejection capability.

bit: the smallest unit of computer memory.

Black burst: video signal used to synchronize the scan timing of multiple devices.

BNC: a connector with a secure locking feature, used for video signals.

Brightness: the darkness or lightness of an image or color; see also, luminance

CD: compact disc, an optical recording system popular for audio and data.

CD-ROM: a subset of CD standards (ROM stands for "read only memory"); holds about 700 MB of data.

Chroma: the color component of a video signal.

Chroma key: a color-based video matte (overlay) system that drops all areas of a selected color, often green or blue, from one image and replaces them with the corresponding areas of a second image.

Component video: video system where the color and luma components of the video signal are kept separate (as Y.U.V. or RGB, etc) to maintain highest image quality.

Composite: **1)** the combination of several images into one; **2)** video system where the color (chroma) and brightness (luma) signals are combined into one waveform.

Compression: translating data into a more compact form by discarding redundant information, then reconstructing the data to its original form; can be either lossless or lossy.

Color correction: the use of filters, processing amplifiers, and other software and/or hardware devices to correct a video image

dB: a unit of measurement for audio signal levels.

Digital video: a method of representing still or moving images by number values instead of by varying magnetic levels (analog video).

Dub: a copy.

DV: a digital video format recorded at 25 Mbps using (roughly) 5:1 compression.

DVCAM: Sony's version of native DV format in a professional sized tape format.

EBU: European Broadcasters Union, the professional standard setting organization for European television.

Field: for a video signal, a set of lines produced by one sweep down the screen. For interlaced video (what we watch on TV), it takes two such fields to make one frame (complete image).

Filter: **1)** A partially transparent material that passes or blocks certain light colors;
2) An electronic circuit or unit that passes or blocks signals of a particular type or frequency;
3) Any circuit or device (hardware or software) that shapes or conditions a signal or information.

FireWire: Apple Computer's trademarked name for IEEE1394.

Frame: **1)** to compose a shot in video or film, to make the image fit into the "frame" of the screen;
2) a complete video image.

Frame synchronizer: a digital buffer that stores a frame of video, compares the sync information to a reference, and releases the frame at a specific time to adjust for timing errors.

Glossary: a list of difficult or specialized words for reference.

GPI: General Purpose Interface, a simple trigger device.

Hue: a specific color; one of the 3 attributes of color, see also saturation, brightness.

IEEE1394: a low cost digital interface that can transport data at up to 400 Mbps.

Impedance: A.C. resistance in an electrical circuit, measured in Ohms. Impedances must be matched in audio circuits to avoid distortion and the introduction of noise.

Key: **1)** in lighting, short for key light, the principle (usually brightest) light used to illuminate the main subject;

2) to switch between two or more video sources using a control signal;

3) an image whose color or brightness is used to determine the switching between two or more video signals.

Level: another word for signal strength, power, volume.

Line level: an audio signal level, between –10dBu and +30dBu, likely to be the output of a cassette deck or CD player as opposed to that of a microphone. Line level signals are most often unbalanced

Luminance: the brightness or intensity of an image, in particular the brightness without regard to color.

Microphone level: a high sensitivity audio input intended for low level signals, such as a microphone, typically below –30dBu.

Non-linear editing (NLE): video editing methods that record source clips on a hard disk, allowing the user to assemble the clips into any order and see the result without shuttling through the tape from beginning to end.

Overdub: to add a signal or channel to existing material, especially audio.

Overlay: to show one image (still, moving, or text) on top of another image.

Pan: moving the camera or point of view horizontally. See also tilt, zoom.

Parameter: a limit, boundary, or defining term.

Pixel: picture element, the smallest part of a picture that can be addressed or changed in a digital image.

Posterize: to transform an image to a more stark form by rounding all tonal values to a smaller number of possible values, with the result being visible banding.

Resolution: a measure of the detail in an image or a sound. Image resolution is often described in pixels (i.e., 1024 x 768 pixels) or bit depth (i.e., 8 or 10 bit). Sound resolution is described in terms of sampling frequency (kHz.) and bit depth. The higher the numbers, the greater the possible detail.

RGB: one format of component video; one of the descriptions of component color space, in this case Red, Green, Blue. See also Y.U.V.

Sampling frequency: the number of times per second that a sound's waveform is captured and converted to digital form, expressed as kiloHertz (kHz.).

Saturation: indicates the strength or richness of a color; from paint mixing terminology, the amount of the color pigment in the mix.

SDI: Serial Digital Interface, a standard for 10 bit digital video with a transfer rate of up to 270 Mbps.

Shot: a single continuous run of film or videotape.

Signal: an electrical current that transmits video or audio information.

SMPTE: the Society of Motion Picture and Television Engineers, the standard-setting professional organization for American television.

Solarize: to invert a range of brightness values in an image.

S-video: Y/C separated video, used with a specific round, 4 pin plug.

Sync: electronic pulses that synchronize the scan rates of different components (cameras, recorders, switcher, etc.) in a video system.

THD (Total Harmonic Distortion): Of a signal (most often audio), the ratio of the sum of the powers of all harmonic frequencies above the fundamental to the power of the fundamental, usually expressed in dB. Useful measurement of the accuracy of an amplifier or signal processor.

Tilt: camera movement of pointing the lens up or down

Time Base Corrector (TBC): a frame synchronizer used to correct timing errors in a video stream.

Unbalanced: an audio circuit in which the 2 legs are not balanced with respect to ground. Less expensive to make, but more susceptible to noise and distortion.

Vector scope: a test instrument for displaying color hue and saturation in a video signal used to aid in color correction.

Waveform monitor: a test instrument which shows a graphical representation of the luminance levels of the video waveform, used, in conjunction with a vectorscope, as an aid in color and image correction and video system set up.

White balance: the adjustments of color circuitry in a video camera to produce an image with balanced white and color components, where the white component has a specific color temperature or color cast.

Y/C: the separate processing of the light (luma or Y) and chroma (C) parts of a video signal for higher image quality than composite video; a.k.a. S-video.

Y.U.V.: one of the formats of component video; one of the descriptions of component color space, in this case Y (luminance), and U (blue), and V (red) hue saturation.

Zoom: **1)** to change the size of an area selected for display to provide either a more detailed view or more of an overview;

2) for a camera shot, to change the distance relationship between the camera and subject.

Tech Notes

Books are written about many of the topics below, large and complex books. Look for them if you want more information than what we have presented here. What we want to do here is to provide a bit more in depth information, deeper background, on some relevant topics, and give you a framework for further technical investigations.

Video Standards, Formats, and Quality

Video standards refer to the broadcast and/or viewing systems; they are specific to certain regions of the world. In the US, Canada, and Japan, the analog standard is NTSC (which stands for National Television Standards Committee, the organization that formalized the standard). In Europe (except France and Eastern Europe), the standard is PAL ("phase alternate line"). In France, the Middle East, and most of Eastern Europe, SECAM ("sequential coleur avec mémoire") is the standard.

Why is this important? In part, because each standard requires compatible monitors, cameras, VCRs, projectors, and switchers. The signals are electronically different from format to format, and so cannot interoperate unless the equipment is specifically designed to be multi-standard.

Within each standard are multiple formats - different systems of recording video onto different types of medium.

At the lowest quality and cost level is VHS, a composite form of video, meaning the chroma (color) and luma (lightness) bits of information are electronically mashed together into one signal: convenient, inexpensive, and very much of a compromise of image quality. Colors are not reproduced especially brilliantly, but first's generation quality is usually high enough for accurate viewing. 8mm is the similar format but recorded on narrower tape. Plugs for composite video can be either RCA or BNC.

Y/C, or S-video, is so named because the chroma (C) and luma (Y) information is kept separate in the signal, processed separately, and even transmitted separately. The result of this separation is far greater color fidelity and detail. S-video can be recorded onto specially formulated VHS (S-VHS) or 8mm (Hi8) tapes. There is a special 4 pin connector for Y/C signals.

There are many variations of 3 wire analog component video: Betacam, MII, etc. They are all relatively (but not completely) similar ways of describing a color space like Y/C, except that the C component is broken into 2 signals, for maximum color reproduction, fidelity, and detail. You may see the signal described as RGB, YUV, YCC, Y B-Y R-Y. Usually cables with BNC connectors are used for component signals.

The point of all this technical information is ultimately to help you to make high quality video: video that looks good and serves the purpose for which it is made. But how do we know if the video is of high quality? And what does that really mean?

There are certain technical standards that video must meet simply in order to be viewable on a monitor. And beyond that fairly cut and dried realm is the area of aesthetics. Which leaves us with the notion that most discussions of video quality are relative, in the sense that there is a context, a purpose to which definitions of quality level relate. For example, a video that looks acceptable on an inexpensive television set might look absolutely horrible on a high end video monitor. Is this because the expensive monitor cannot display the video properly? No, probably not. In fact, the reverse is true: the inexpensive monitor doesn't show enough of the signal to reveal how bad it actually is or where the problems actually lie. The context in this case is the display, the quality of the monitor.

As video makers, we have to produce to the quality specifications our clients' demand, what is appropriate for the project, what they can afford. If the clients are ourselves, then the quality level has to be better than the weakest link in the viewing chain - now or in the future - but not so good that the cost of producing prohibits the production.

One important way, perhaps the most important way, to make sure that your video really looks as good on other monitors as it does on yours is to monitor the video with a properly calibrated monitor of as professional-level quality as you can afford. See below for some methods to calibrate monitors. And it goes without saying that you should have dependable, high quality audio monitoring as well, either through headphones or speakers you can trust.

A second way to be sure that your video looks as good as it can is to use, if available, monitoring test equipment (waveform monitor, vector scope) in parallel with the well-calibrated monitor mentioned above.

Monitor Calibration (procedures, test patterns/bars)

The following technique was suggested by an old broadcast engineer who began working in video when tape was two inches wide and scene changes were made with razor blades and tapes; Fades and dissolves did not exist. One had to walk up 6 flights of stairs to the studio and back, often carrying a 65-pound camera. Test instruments were expensive and often unavailable. Network engineers had to find a convenient, simple, reliable way to calibrate monitors that could be done in the field. (You could always recognize one of these fellows by the Wratten 47B (dark blue) they kept in their wallets or in their mechanical pencil pocket protectors, along with their little screwdrivers.)

To calibrate a monitor is to adjust it so that it displays colors that are the same as a standard. That standard, and a major aid to calibration, is called color bars: a pattern of colored strips (and in some cases gray scale strips) of very specific colors, arranged in a very specific way.

To do the following calibration procedure, you will need a source of standard color bars. There are several possible places to get this: your camera may generate bars; perhaps your black burst generator puts ouT-Bars; you could use a graphics program on your computer to display an image of standard color bars. There are numerous places on the Internet to download standard color bars if you don't have them; do an Internet search for "color bars" and take your pick.

The following procedure will be described using SMPTE bars, but EBU bars will work for most of this technique as well. As you will see, they bars are different in format, in part because of the differences in broadcast systems between NTSC and PAL, but much of the usage will be the same. You can use the SMPTE bars regardless of where you are and what video system you are producing for, just as you can use EBU bars wherever. You'll notice that the EBU bars don't have the gray scale information

The first thing to do is to get the color bars displayed on the monitor you want to calibrate. And then, locate the image controls on the video monitor, as these are the ones we will be adjusting.

Turn the contrast control to its midpoint. Turn the chroma (color) control all the way down so the screen image is shades of black, white, and gray.

Look in the lower right corner of the color bars. In the absolute lower right corner is a black square. Immediately to the left of that black square are three thinner vertical bars. (These are called Pluge Bars, which stands for Picture Lineup Generating Equipment.) Actually, when the monitor is correctly adjusted, you should only see two of these bars. Adjust the brightness control until the bar on the right is just barely visible, and the bar in the middle is just not visible.

Now look at the lower left hand corner: the second box in from the left is a pure white. Turn the contrast control all the way to maximum and watch the white box flare and bloom. Now turn down the contrast control just until the white box begins to change noticeably. At this point, the Pluge Bars should still look as you set them in the previous step above: only the right most should be barely visible. If that is not the case, adjust the brightness control until it is.

If your monitor doesn't have a blue only switch, you have to do this next bit strictly by eyeball and luck: put the color control to the midpoint, and adjust the hue control so that the vertical yellow bar is a lemon yellow (no orange or green tint) and the vertical magenta bar should not tilt toward red or purple.

If your monitor does have a blue only switch, or if you can find some blue lighting gel (like Wratten 47B dark blue), make it so the monitor is blue only. As you look at the top half of the bars, the large vertical

bars should look like alternating bars of equal brightness. Adjust the chroma control until the gray bar on the far left and the blue bar on the far right are of equal intensity. As an aid in doing this, look at the line of horizontal bars and match the gray vertical bar on the left with the gray horizontal bar on the right. Or do the same with the blue bars.

Next adjust the hue control until the cyan and magenta vertical bars are of the same brightness. Use the same technique described above, matching the vertical bar with the diagonally opposite horizontal bar of the same color.

The goal of these last 2 adjustments, to chroma and hue, is to make the 4 large vertical bars (gray, cyan, magenta, and blue) of all the same intensity or brightness.

When that is done, turn off the blue only switch or remove the blue filter, and look at some program material (video) with skin tones, and use that as a somewhat subjective (though accurate) basis for making fine tuning adjustments to chroma and hue.

If you have a waveform monitor and/or a vector scope, you can and probably do use it to check and adjust the input video signals. The instruction manual will give you all the information you need.

But, if you don't have a waveform monitor/vector scope to adjust incoming video, you can make those adjustments by eye, using the SE-500's color processing controls, now that you have a properly calibrated program monitor. The process for each input channel will be very similar to the process we just used to calibrate the program monitor, except we were adjusting the controls on the monitor, and now we will be adjusting the controls on the SE-500.

For each input you plan to be using, have a valid signal and adjust the Color Processor controls on the SE-500 in this order:

1. Set Y-Gain to Zero; turn color all the way down so that the image is gray;
2. Adjust brightness until the image shows shadow detail and no blown out highlights;
3. Adjust Y-Gain until just before the highlights bloom;
4. (NTSC only) Bring the color control back to its midpoint; adjust hue so that the skin tones look natural;
5. Adjust color, and hue if necessary, to keep the skin tones natural and not oversaturated (too red).

Specifications

Video Formats
Analog Y/C, Composite CCIR601 NTSC and PAL (PAL and NTSC are separate models)

Video Inputs
4 – S (Y/C), Composite

Video Output
1 – Quad Video source monitoring (Composite)
2 – Composite
1 – S (Y/C)
1 – Component (With breakout cable, it uses the S (Y/C), and one Composite output.)

Audio Inputs
1 – Stereo input (RCA connector)
2 – Mono Microphone (1/4" phono jack)

Audio Output
1 – Stereo main outputs (RCA connector)
1 – Stereo headphone (Mini jack with volume control) 0.3Wrms 8 ohm

Quad Channel Time Base Correction
Full Frame Synchronization, 4:2:2, 13.5MHz

Digital Effects including
A/B dissolves, PIP, border lines, and over 12 Wipes with various manually transition speeds

RS-232 Data Control Port
Connecting PC RS-232 for remote control

Color Processing
Brightness +/-10%
Y-gain +/- 3dB
Color +3/-10dB
Tint +/- 10 degrees (NTSC only)

Video Bandwidth
Component 5.2 MHz
S (Y/C) 5.0 MHz
Composite 4.5 MHz
DG, DP +/- 3%, 3 degrees

Signal/Noise Ratio:
Video > 50 dB
Audio > 65 dB

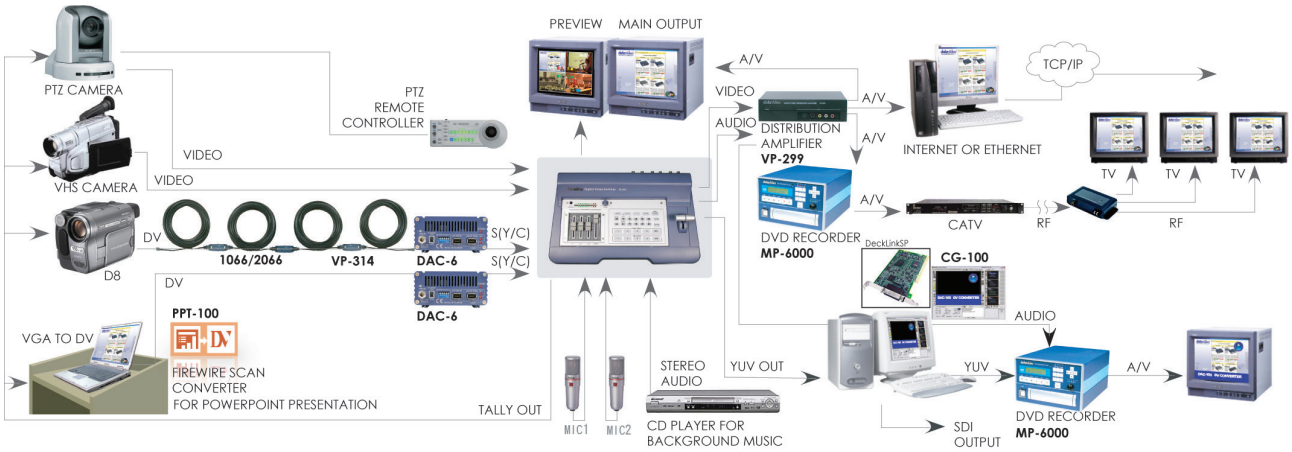
Audio
20 to 20 KHz +/-3dB
Audio THD <0.1%

Dimensions W x D x H
15.75" x 10.5" x 3.25" (Approx)
400mm x 265mm x 83mm (Approx)

Weight
5.5 lb, 2.2 Kg

Power
Input: DC 12V, 1.5A (11W)

Useful Accessories from Datavideo



Datavideo CG- CG-100

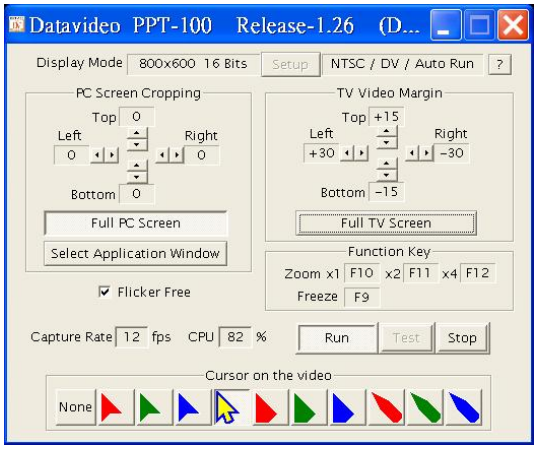
THE FIRST AFFORDABLE SDI CG SOLUTION LIVE SDI TITLE / GRAPHIC / LOGO OVERLAY

CG-100 can be used in any SDI or YUV input switchers. It can be also used in SE-500 via YUV output interfaces.

SDI overlay offers the best, broadcast quality, CG solution in the industry today. However, it has always been beyond the budget of small studios and production houses - The Datavideo CG-100 has changed that!

The CG-100 combines with a Blackmagic Design Decklink Card to bring you live SDI CG overlay at an affordable price. It supports NTSC and PAL video standards and is able to generate graphics for 16:9 or 4:3 aspect ratios. Pages can be composed and combined with animation effects, to run as a sequence, or they can be displayed and edited live. The CG-100 combines perfectly with the SE-500/SE-800 to give superb quality graphics / text / logo overlay on live production mixes.

Datavideo VGA to DV converter- PPT-100



In many conferences and seminars, lecturers need to present videos and additional PC information to the audience. When they switch sources between PC and other medias on the projector, will cause the transient black picture and then interrupt the meeting process. The solution is a high-end VGA to video converter, which converts VGA to high-resolution video, enabling the PC output to be selected via a video switcher.

Thanks to Blackmagic Design and Datavideo the solution is at hand. Blackmagic Design have introduced a low cost range of SDI solutions, which are called the “Decklink Series”, and Datavideo have developed the first software for displaying VGA directly out thru these Decklink SDI cards. The Datavideo PPT-100 takes full advantage of the Decklink card and Intel 915 chipset technology. Users can easily convert PC images (VGA) to SDI, change image position and size, and select

different colors for the pointer; and then, display on projector or large TV wall. With a vision mixer / switcher such as the SE-800, you can also combine DVD player, DV camera, VCR, VHS and CD player for a perfect presentation.

Datavideo TLM-70D 7” TFT LCD

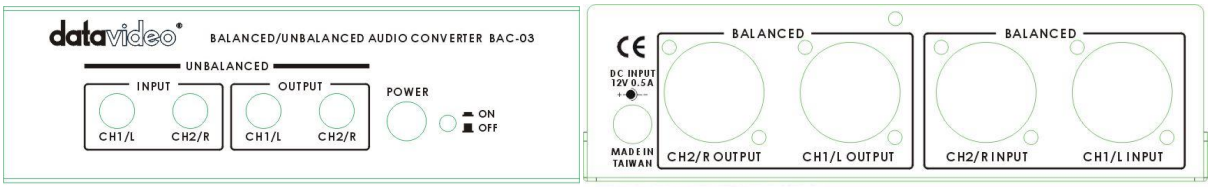
Datavideo TLM-70D is a 7” TFT LCD monitors, 3U height design with TLM-70JF you can easily to insert it on standard 19" rack cabinet. NTSC/PAL video format auto recognition (Analog video only) with video passes through 75-ohm self-terminated video output connector. The "AUX" input provides options for external format converters such as SDI input converter. With contrast, brightness, color and tint (Tint only available for NTSC) controls for a best view quality of display.

- LCD Display — 7" TFT LCD active matrix, resolution 1480 x 234
- Aspect Ratio — 4:3/16:9
- Brightness (luminance) — 250 NITs
- Video Input — 1.0 Vp-p, 75 Ohm
- Video Output — Loop-through with self 75 Ohm-terminated
- Video System — NTSC/PAL auto recognition (Analog only)
- Tally Indication — 3-color Tally LED indicators
- Power Consumption — DC12Volt. 50W.

Datavideo DAC-6 DV to Analog (One way converter)

The DAC-6 is designed to allow DV cameras to be used with the SE 500. It is a stand-alone converter that takes a DV signal in and converts it to an analog output, in Composite, S (Y/C) or Component format. It is a very compact converter and can be run from a 12 Volt battery in the field, or via the power adaptor supplied.

Datavideo BAC-03 Balanced-Unbalanced Audio converter



The BAC-03 is a bi-directional unbalanced to balanced and balanced to unbalanced audio converter, with four independent amplifiers providing stereo audio input and output.

SPECIFICATIONS	**UNBAL to BAL output**	**BAL to UNBAL output**
INPUT LEVEL	-10dBv nominal	0dBm to +8dBm nominal
INPUT IMPED	50K ohms	0K ohm
GAIN	+4 to +20dB	-20dB to +18dB
OUTPUT LEVEL	0 to +8dBm nom, +22dBm max	-10dBv nom, +20dBv max
OUTPUT LOAD	600 ohms or higher, balanced	600 ohms or higher, unbalanced
FREQ RESPONSE	20Hz to 25kHz, +/-0.5dB	20Hz to 25kHz, +/-0.5dB
NOISE LEVEL	80dB below nom output level	80dB below nom output level
DISTORTION	<0.01% at any frequency	<0.01% at any frequency
POWER INPUT	DC 12V, 500mA	
DIMENSION	140(W) x 112(D) x 40(H) mm	

Bi-Directional IEEE/1394 DV Format Repeater:

Allows extended DV cable runs. If you want to run a DV cable more than 20 meters an in-line booster is required, the DV repeater is just that. Use one every 20 meters for cable runs of up to 200 meters

One channel DV repeater (VP-314)

One input to five channels output DV-DA (VP-332)

20/10 meter DV cable
P/N: 2066/1066

Please check website (www.datavideo-tek.com) for the most up to date list, descriptions, and pricing of accessories for the SE-800.

SE500 RS-232 Remote Control Command

VER: 1.03

Release date: 2006/02/22

1. Physical layer

1.1 Control output format: RS-232C
1.2 Communication rate: 57600 BPS
1.3 Data format: 8 bits serial, LSB first, 1 start bit, 1 stop bit, odd parity
1.4 Must delay 100uSEC between 2 bytes

2. Data link layer

2.1 Frame format

1st	2nd	3rd	4th	5th	6th	7th	,,,	Last-2	Last-1	Last
Header	ID	Length	Data0	Data1	Data2	Data3	,,,	Chksum_L	Chksum_H	End

1) Header

Code consisting of one byte for frame synchronization.
The frame header send from the master machine is termed the command header.
The frame header send from the slave machine is termed the return header.

The command header byte is fixed as fallow.
1st: F0h (base 16)

The return header byte is fixed as fallow.
1st: FCh (base 16)

2) ID number

The equipment ID number is composed of 8 bits
The ID of SE500: 32h (base 16)

3) Length

The length is the sum of bytes from the header to the end.
It is composed of 8 bits.
6h (base 16) < Length <= 80h (base 16)

4) Data

Data block used by application layer.
Refer to Section 3.

5) Checksum

The 8 bits checksum is obtain from header to the last data, and then convert to two numeric ASCII code.

Checksum=header+ID+legth+data0+data1+…+data_last
chksum_L=(low nibble of checksum) + 30h
chksum_H=(high nibble of checksum) + 30h

6) End

The end byte are fixed to FFh(base 16).

3. Application layer

The application layer designates the command structure and contents.

3.1 Command data format

4th	5th	6th	7th	8th	9th	10th	11th	…
Command Group	Operated #0	Operated #1	Operated #2	Operated #3	Operated #4	Operated #5	Operated #6	…

1) The command group
05h (base 16) = SE500 control command
2) The operated refer to section 4.

3.2 Return data format

4th	5th	6th	7th	8th	9th	10th	11th	…
Command Status	parameter #0	parameter #1	parameter #2	parameter #3	parameter #4	parameter #5	parameter #6	…

1) The command status
05h=SE500 control command status

2) The parameter refers to section 6.

4. The operated of SE500 control command

5th	6th	7th	8th			
Operated #0	Operated #1	Operated #2	Operated #3			
Mode Code	Key code	T-bar low	T-bar high			

4.1. OP#0 = Control mode code
00H = Ask status
01H = Normal key control
02H = T-BAR control

OP#1 = control key code.(refer to section 5) when OP#0=01H
= 00h= disable remote control T-bar when OP#0=02H
= 01h= enable remote control T-bar when OP#0=02H

4.2. OP#2 and OP#3 = T-BAR control value when OP#0=02H
The T-bar control value is 10 bits
The bit4 to bit 0 of OP#1 = the low 5 bits of the T-bar control value.
The bit4 to bit 0 of OP#2 = the high5 bits of the T-bar control value.

5. The SE500 control key code

(Base 16)
01h = key_main_A
02h = key_main_B
03h = key_main_C
04h = key_main_D
05h = key_main_BK

06h = key_sub_A
07h = key_sub_B
08h = key_sub_C
09h = key_sub_D
0ah = key_sub_BK

0bh = key_QUAD
0ch = key_POP
0dh = key_freeze
0eh = key_preview
0fh = key_take

10h = key_fade
11h = key_center_block (wipe)
12h= key_right_top_block (wipe)
13h= key_right_bottom_block (wipe)
14h= key_left_top_block (wipe)

15h= key_left_bottom_block (wipe)
16h= key_top_block (wipe)
17h= key_bottom_block (wipe)
18h= key_right_block (wipe)
19h= key_left_block (wipe)
1ah= key_horizontal (wipe)
1bh= key_vertical (wipe)

20h= key_border_on
22h= key_background_color
24h= key_speed*
26h= key_PIP
28h = key_speed1**
29h = key_speed2**
2ah = key_speed3**

3bh = key_menu
3ch = key_up
3dh = key_down
3eh = key_left
3fh = key_right

40h = key_reset
41h = key_plus
42h = key_minus

*Note: Send the key_speed code to the SE500, the speed of effect will be changed follow below rule.
SPEED_1 →SPEED_2→SPEED_3→SPEED_1→,,,,

6. The return parameter of SE500 control command status

5th	6th	7th	8th	9th	10th	11th	12th
parameter #0	parameter #1	Parameter #2	parameter #3	parameter #4	parameter #5	parameter #6	Parameter #7
Error code	Busy flag	Effect Mode +Speed	Effect No.	Background Color & border	LED1	LED2	LED3

13th	14th	,,,
parameter #8	parameter #9	,,,
LED4	LED5	,,,

1) The error code
01h = Time out (over 15ms)
02h = length error
03h = checksum error
04h = not support command
05h = operated error

2) The Busy Flag
00h = ready
01h = busy
11h = busy + T_bar active

3) The effect mode & effect speed
The bit 3 to bit0 is the effect mode
x0h=cut mode, x1h=MENU mode, x2h=fade mode, x3h=wipe mode, x4h=QUAD mode, x5h=POP mode, x6h=PIP mode

The bit6 to bit4 are the auto effect speed
0xh = SPEED_1, 1xh= SPEED_2

2xh = SPEED_3

4) The effect No.
The value from 0 to 99(63h)
Fade effect No. = 0
Wipe effect No.= 0 to 10
Quad effect No.= 0
POP effect No. = 0 to 1
PIP effect No.:bit3 to bit0= x0h to x4h (position)
Bit4=0=big size, bit4=1=small size
Bit5=0=not shift, bit5=1=shift to close center.

5) The background color & border
The bit4 to bit0 are the background color
x0h=Black , x1h=Blue , x2h=Magenta , x3h=Red
x4h=Green , x5h=Cyan , x6h=Yellow , x7h=White

The bit5 are the border flag
0xh= border off
1xh= border on

6) LED data
The bit = 1 = LED on, the bit = 0 = LED off
Bit0 of LED1 = LED of key_main_a
Bit1 of LED1 = LED of key_main_b
Bit2 of LED1 = LED of key_main_c
Bit3 of LED1 = LED of key_main_d
Bit4 of LED1 = LED of key_main_bk
Bit6 of LED1 = LED of key_take

Bit0 of LED2 = LED of key_sub_a
Bit1 of LED2 = LED of key_sub_b
Bit2 of LED2 = LED of key_sub_c
Bit3 of LED2 = LED of key_sub_d
Bit4 of LED2 = LED of key_sub_bk
Bit6 of LED2 = LED of key_preview

Bit0 of LED3 = LED of key_FADE
Bit1 of LED3 = LED of key_QUAD
Bit2 of LED3 = LED of key_POP
Bit3 of LED3 = LED of key_PIP
Bit4 of LED3 = LED of key_freeze
Bit5 of LED3 = LED of key_border
Bit6 of LED3 = LED of key_MENU

Bit0 of LED4 = LED of key_center_block
Bit1 of LED4 = LED of key_right_top_block
Bit2 of LED4 = LED of key_right_bottom_block
Bit3 of LED4 = LED of key_left_top_block
Bit4 of LED4 = LED of key_left_bottom_block
Bit5 of LED4 = LED of key_top_block
Bit6 of LED4 = LED of key_bottom_block

Bit0 of LED5 = LED of key_right_block
Bit1 of LED5 = LED of key_left_block
Bit2 of LED5 = LED of key_horizontal
Bit3 of LED5 = LED of key_vertical
Bit4 of LED5 = LED1 of speed
Bit5 of LED5 = LED2 of speed
Bit6 of LED5 = LED3 of speed

7. EXAMPLE

1) PC control SE500, key command = key_take= 0fh

a.) The command stream = F0h,32h,0eh,05h,01h,0fh,,30h,34h,ffh

Header=F0h
ID=32h
Length = 9 bytes=09h
Command group=05h
Command mode=normal control code=01h
Control key code=key_take =0fh
checksum= (f0h+32h+09h+05h+01h+0fh) = 40h
checksum_low =00h+30h = 30h
checksum_high=04h+30h = 34h
END =ffh

b.) SE500 return data,

The return data stream =
Fch,32h,11h,05h,00h,01h,10h,00h,07h,41h,42h,01h,00h,20h,30h,30h,ffh
Header=fch
ID=32h
Length = 17 bytes=11h
Command status=05h
Error code =00h
Busy flag=01h
Effect mode & speed=fade +speed_2=00h+10h=10h
Effect No. =00h
Background color & border =white + border off =07h +00h=07h
LED1=41h
LED2=42h
LED3=01h
LED4=00h
LED5=20h
Checksum = (fch+32h+11h+05h+00h+01h+10h+00h+07h+41h+42h+01h+00h+20h) =x00h
checksum_low =00h+30h = 30h
checksum_high=00h+30h = 30h
END=ffh

SE500 MIDI Remote Control Command

VER: 1.00a

Release date: 2005/06/03

1. Physical layer

1.5 Follow the MIDI SPEC. 1.0
1.6 Communication rate: 31250 BPS
1.7 Data format: 8 bits serial, LSB first, 1 start bit, 1 stop bit, none parity

2. Data link layer

2.1 Control messages = MIDI Channel voice messages
* Received only if Note Mode is ON
* The input of each channel is selected.
* Ignored if a non-selectable note message is received.

2.2 Control messages
* Note –on

Status	2nd byte	3rd byte
9nH	kkH	vvH

Symbol	Meaning	Range
n:	MIDI channel	0H-FH(ch.1--ch.16)
kk:	Note number = SE500 control command	00H-7FH(0--127)
vv:	Velocity value,etc. Only in the case of Note-on Velocity	00H-7FH(0--127) 01H-7FH(1--127)

3. SE500 control command correspond to note number as follows

Note	Note No.	SE500 command
C4	48	fade key
C#4	49	wipe key
D4	50	wipe key
D#4	51	wipe key
E4	52	wipe key
F4	53	wipe key
F#4	54	wipe key
G4	55	wipe key
G#4	56	wipe key
A4	57	wipe key
A#4	58	wipe key
B4	59	wipe key
C5	60	SUB A key
C#5	61	QUAD key
D5	62	SUB B key
D#5	63	SPLIT key
E5	64	SUB C key

F5	65	SUB D key
F#5	66	PIP key
G5	67	SUB BG key
G#5	68	Freeze key
A5	69	Preview key
A#5	70	NC
B5	71	TAKE key
C6	72	MAIN A key
C#6	73	Background color key
D6	74	MAIN B key
D#6	75	Border key
E6	76	MAIN C key
F6	77	MAIN D key
F#6	78	Speed _1 key
G6	79	MAIN BG key
G#6	80	Speed_ 2 key
A6	81	Change Speed key
A#6	82	Speed_ 3 key

4. Example

1. Change the transition effect to fade = 90H, 30H, 64H
   90H= Note on, Channel =1 (IF the SE500's MIDI channel is 1)
   30H=Note No 48=fade key
   64H= Velocity value > 0

2. Take the transition effect = 90H, 47H, 64H
   47H=Note No 71=Take key

*** Very Easy to use, any MIDI keyboard can control the SE500.**

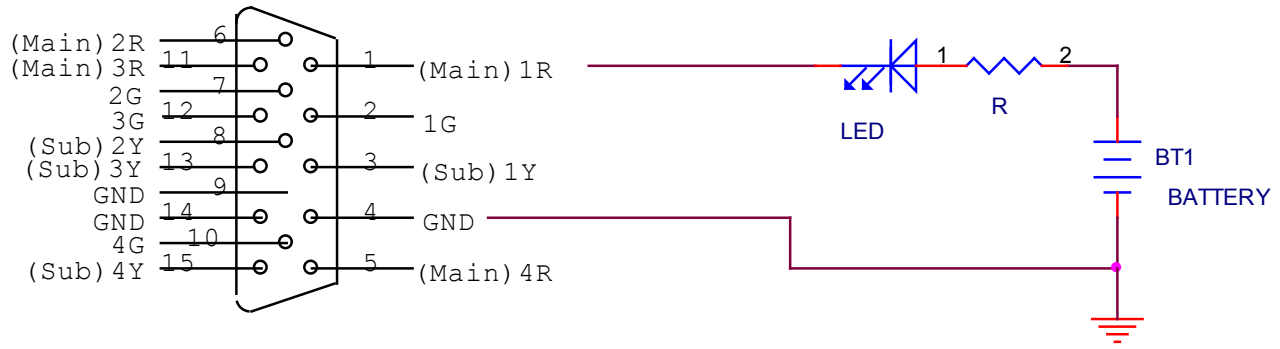
SE500 Tally Pin Outs Cross Reference

VER: 1.00

Release date: 2005/07/07

LED A3	= pin 1	= 1R (Main1)
LED A2	= pin 2	= 1G
LED A1	= pin 3	= 1Y (Sub1)
Ground	= pin 4	= GND
LED D3	= pin 5	= 4R (Main4)
LED B3	= pin 6	= 2R (MAIN2)
LED B2	= pin 7	= 2G
LED B1	= pin 8	= 2Y (Sub2)
Ground	= pin 9	= GND
LED D2	= pin 10	= 4G
LED C3	= pin 11	= 3R (Main3)
LED C2	= pin 12	= 3G
LED C1 = pin 13		= 3Y (Sub3)
Ground	= pin 14	= GND
LED D1	= pin 15	= 4Y (Sub4)

Video Channel	Red LED (On Air)	Green LED (Off line)	Yellow LED (Next)
1	Pin 1	Pin 2	Pin 3
2	Pin 6	Pin 7	Pin 8
3	Pin 11	Pin 12	Pin 13
4	Pin 5	Pin 10	Pin 15



Product registration

Go on line www.datavideo.info for product registration

See the warranty card for warranty period

REGISTRATION CARD QUESTIONS

SE-500 REGISTRATION CARD – Please return this card for product warranty registration

Serial Number:

Where did you purchase:

Your name:

Your mailing Address:

Email address:

May we include you in our mailing list to learn about new Datavideo products? Yes/No

Why did you buy the SE-500?

Do you have a COMPONENT video recorder or player?

What video sources will you use with the SE-500?

Where will you use your SE-500?

Notes

Notes

Notes

Service & Support

It is our goal to make owning and using Datavideo products a satisfying experience. Our support staff is available to assist you to set up and operate your system. Contact your local office for specific support requests. Plus, please visit www.datavideo.com to access our FAQ section.

Datavideo Taiwan
Datavideo Technologies Co. Ltd
10F. No. 176, Jian 1st Rd.,Chung Ho District, New Taipei City 235, Taiwan, R.O.C.
Tel: +886-2-8227-2888
Fax: +886-2-8227-2777
E-mail:service@datavideo.com.tw

Datavideo Europe
Datavideo Technologies Europe BV
Floridadreef 106
3565 AM Utrecht,
The Netherlands
Tel:+31-30-261-96-56
Fax:+31-30-261-96-57
E-mail:info@datavideo.nl

Datavideo United Kingdom
Datavideo UK Limited
Units1 & 2 Waterside Business Park
Hadfield, Glossop, Derbyshire
SK13 1BE, UK
Tel:+44-1457 851 000
Fax:+44-1457 850 964
E-mail:sales@datavideo.co.uk

Datavideo USA
Datavideo Corporation
7048 Elmer Avenue.
Whittier, CA 90602,
U.S.A.
Tel:+1-562-696 2324
Fax:+1-562-698 6930
E-mail:sales@datavideo.us

Datavideo China
Datavideo Technologies China Co
101,NO.618,LiuYing Rd,Zhabei District, Shanghai,China

Tel: +86 21-5603 6599
Fax: +86 21-5603 6770
E-mail:service@datavideo.cn

Datavideo Singapore
Datavideo Technologies (S) PTE Ltd
No. 178 Paya Lebar Road #06-03
Singapore 409030

Tel:+65-6749 6866
Fax:+65-6749 3266
E-mail:sales@datavideo.sg

Datavideo Hong Kong
Datavideo Hong Kong Ltd
G/F.,26 Cross Lane
Wanchai, Hong Kong
Tel: +852-2833-1981
Fax: +852-2833-9916
E-mail:info@datavideo.com.hk

Datavideo France
Datavideo France s.a.r.l
Cité Descartes 1,rue Albert Einstein
Champs sur Marne
774477-Marne la Vallée cedex 2
Tel:+33-1-60370246
E-mail: info@datavideo.fr

Datavideo India
Datavideo Technologies India Pvt Ltd
A-132, Sec-63,Noida-201307,
Uttar Pradesh (UP), India.
Tel:+91-0120-2427337
Fax:+91-0120-2427338
E-mail: sales@datavideo.in

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